soccerdata

Release 1.6.1

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Release v1.6.1. (`pip install soccerdata`)

SoccerData is a collection of scrapers to gather soccer data from popular websites, including Club Elo, ESPN, FBref, FiveThirtyEight, Football-Data.co.uk, FotMob, Sofascore, SoFIFA, Understat and WhoScored.

```
import soccerdata as sd

# Create a scraper class instance for the 2018/19 Premier League
five38 = sd.FiveThirtyEight('ENG-Premier League', '1819')

# Fetch data
games = five38.read_games()
forecasts = five38.read_forecasts()
clinches = five38.read_clinches()
```

Main features

- Access current and historical soccer fixtures, forecasts, detailed match stats, event stream data and more.
- All data is provided in the form of Pandas DataFrames with sensible, matching column names and identifiers across datasets to make working with the data and combining data from multiple sources easy.
- Data is only downloaded when needed and cached locally to speed up your analyis scripts.
- Integrates with the socceraction package to allow analysis of event stream data.

Do you like it? *Let's dive in!*

CHAPTER

ONE

GETTING STARTED

New to *soccerdata*? Well, you came to the right place: this tutorial will walk you through installing, configuring, and using the library. By the end of this tutorial, you will be able to scrape data from the top-5 European leagues and use it to create your own data-driven analyses.

1.1 Installation

SoccerData can be easily installed via pip:

```
python3 -m pip install soccerdata
```

1.2 Scraping data

Each of the *supported data sources* has its corresponding class for fetching data with a uniform API. For example, the *FBref* class is used to fetch data from fbref.com.

```
import soccerdata as sd

# Create scraper class instance
fbref = sd.FBref()
```

Once you have a scraper class instance, you can use it to fetch data. See the the *examples* and *API reference* for the full list of options available for each scraper. For example, to fetch aggregated shooting stats for all teams:

```
# Create dataframes
season_stats = fbref.read_team_season_stats(stat_type='shooting')
```

The data is always returned as a convenient Pandas DataFrame.

leag	season	team	#Pl	90s	Gls	Sh	SoT	SoT	Sh/	SoT	G/S	G/S	Dist	FK	PK	PKa	xG	npx	npx	G-xG	np:G-xG
ENG Prem Lea	202	Arsenal	29	38.0	53	455	141	31.0	11.9	3.71	0.1	0.33	16.9	23	6	6	53.5	49.0	0.11	-0.5	-2.0
		Aston Vill	24	38.0	52	518	179	34.6	13.6	4.71	0.09	0.26	16.5	15	5	6	52.9	48.5	0.1	-0.9	-1.5
		Brig	27	38.0	39	476	129	27.1	12.5	3.39	0.07	0.26	16.6	14	6	9	51.6	44.8	0.1	-12.6	-11.8
		Burley	25	38.0	32	383	125	32.6	10.0	3.29	0.08	0.23	16.6	15	3	3	39.9	37.6	0.1	-7.9	-8.6
		Che	27	38.0	56	553	194	35.1	14.5	5.11	0.09	0.25	16.3	16	8	10	64.0	56.4	0.1	-8.0	-8.4

By default, the data for all available leagues and the five most recent seasons will be retrieved. However, in most cases, you would want to limit the data to specific leagues and / or seasons. This can be done by passing a list of leagues and seasons to the constructor of the scraper class. For example:

```
# Create scraper class instance filtering on specific leagues and seasons
fbref = sd.FBref(leagues=['ENG-Premier League'], seasons=['1718', '1819'])
# Retrieve data for the specified leagues and seasons
season_stats = fbref.read_team_season_stats(stat_type='shooting')
```

Note that only a limited number of leagues are supported out-of-the-box. The leagues available for each source can be listed with the *available_leagues()* class method.

```
sd.FBref.available_leagues()
>>> ['ENG-Premier League', 'ESP-La Liga', 'FRA-Ligue 1', 'GER-Bundesliga', 'ITA-Serie A']
```

You can *add more leagues* but there are no guarantees that they will be scraped correctly.

1.3 Data caching

Data caching is used to speed up the runtime and to prevent exceeding the rate limit of web servers. By default, all downloaded data is cached to `~/soccerdata` on Linux and Mac OS, and to `C:\Users\yourusername\soccerdata` on Windows. A custom location can be set if desired. You can configure this using environment variables (see below) or on the level of an individual scraper by setting the `data_dir` parameter when creating the scraper class instance:

```
# Create scraper class instance with custom caching directory
fbref = sd.FBref(data_dir="/tmp/FBref")
```

This directory can be deleted at any time to reclaim disk space. However, this also means you will have to redownload the same data again if you need it, which will lead to reduced performance.

SoccerData has no knowledge of when the data on the server changes, so it is up to the user to decide when to refresh the cache. This can be done by deleting the cache directory or by setting the `no_cache` option to `True` when creating the scraper class instance:

```
# Create scraper class instance which always re-downloads the latest data
fbref = sd.FBref(no_cache=True)
```

Some methods will assume the cache is always out-of-date (for example, when scraping the fixture of the current season). Typically, these methods will have a `force_cache` option that can be set to `True` to force the cached data to be used. For example:

```
fbref = sd.FBref(leagues=['ENG-Premier League'], seasons=['2324'])
fbref.read_schedule(force_cache=True)
```

Caching can also be disabled entirely by setting the `no_store` option to `True` when creating the scraper class instance. However, it should almost always be left enabled.

```
# Create scraper class instance with caching disabled
fbref = sd.FBref(no_store=True)
```

1.4 Global configuration

Several settings can be configured globally using the following environment variables:

SOCCERDATA_DIR
: The directory where the downloaded data is cached and where logs are stored. By default, all data is stored to `~/soccerdata` on Linux / Mac OS and `C:\Users\yourusername\soccerdata` on Windows.

SOCCERDATA_NOCACHE
: If set to "true", no cached data is returned. Note that no-cache does not mean "don't cache". All downloaded data is still cached and overwrites existing caches. If the sense of "don't cache" that you want is actually "don't store", then `SOCCERDATA_NOSTORE` is the option to use. By default, data is retrieved from the cache.

SOCCERDATA_NOSTORE
: If set to "true", no data is stored. By default, data is cached.

SOCCERDATA_MAXAGE
: The maximum age of cached data in seconds. If the cached data is older than this, it will be re-downloaded. By default, this is set to infinity.

SOCCERDATA_LOGLEVEL
: The level of logging to use. By default, this is set to "INFO".

Example:

```
# bash
export SOCCERDATA_DIR = "~/soccerdata"
export SOCCERDATA_NOCACHE = "False"
export SOCCERDATA_NOSTORE = "False"
export SOCCERDATA_LOGLEVEL = "INFO"
```

1.5 Uniform team names

Each data source uses a different set of team names, which makes it difficult to combine data from multiple sources. To mitigate this, SoccerData allows translating the team names to uniform names. This is done by providing a `SOCCERDATA_DIR/config/team_dict.json` file. This file should contain a mapping between a generic name for each team and the team name used by each data source that you want to support. The example below will map "Tottenham Hotspur", "Tottenham Hotspur FC" and "Spurs" to "Tottenham" in all scraped data.

```
{
  "Tottenham": ["Tottenham Hotspur", "Tottenham Hotspur FC", "Spurs"],
}
```

1.6 Additional setup for scraping WhoScored data

WhoScored implements strong protection against scraping using Incapsula. To circumvent this, this scraper uses Selenium with the ChromeDriver extension to emulate a real user. Before using this scraper, you will have to install Chrome. A Selenium driver matching your Chrome version will be downloaded automatically when you run the scraper.

1.7 Next steps

Look at you! You're now basically an expert at SoccerData!

From this point you can:

- Look at the example notebooks for each *Data source*.
- Take a deep dive into the *API*.
- Give us feedback or contribute, see *Contributing*.

Have fun!

CHAPTER

TWO

OVERVIEW OF DATA SOURCES

Currently, the following data sources are supported.

ClubElo

URL | *Example usage* | *API reference*

```
from soccerdata import ClubElo
```

Team's relative strengths as Elo ratings, for most European leagues. Recalculated after every round, includes history.

ESPN

URL | *Example usage* | *API reference*

```
from soccerdata import ESPN
```

Historical results, statistics and lineups.

FBref

URL | *Example usage* | *API reference*

```
from soccerdata import FBref
```

Historical results, lineups, and detailed aggregated statistics for teams and individual players based on Stats Perform data.

FiveThirtyEight

URL | *Example usage* | *API reference*

```
from soccerdata import FiveThirtyEight
```

Team's relative strengths as SPI ratings, predictions and results for the top European and American leagues.

Football-Data.co.uk

URL | *Example usage* | *API reference*

```
from soccerdata import MatchHistory
```

Historical results, betting odds and match statistics. Level of detail depends on league.

Sofascore
URL | Example usage | *API reference*

```
from soccerdata import Sofascore
```

Results, schedules, lineups, and detailed statistics for teams and individual players.

SoFIFA
URL | *Example usage* | *API reference*

```
from soccerdata import SoFIFA
```

Detailed scores on all player's abilities from EA Sports FC.

Understat
URL | *Example usage* | *API reference*

```
from soccerdata import Understat
```

Advanced statistics such as xG, xGBuildup and xGChain, and shot events with associated xG values for the top European leagues.

WhoScored
URL | *Example usage* | *API reference*

```
from soccerdata import WhoScored
```

Historical results, match preview data and detailed Opta event stream data for major leagues.

The following section was generated from `doc/datasources/ClubElo.ipynb`

[2]:
```
import soccerdata as sd
```

2.1 ClubElo

[3]:
```
elo = sd.ClubElo()
print(elo.__doc__)
```

```
Provides pd.DataFrames from CSV API at http://api.clubelo.com.

    Data will be downloaded as necessary and cached locally in
    ``~/soccerdata/data/ClubElo``.

    Since the source does not provide league names, this class will not filter
    by league. League names will be inserted from the other sources where
    available. Leagues that are only covered by clubelo.com will have NaN
    values.

    Parameters
    ----------
    proxy : 'tor' or or dict or list(dict) or callable, optional
        Use a proxy to hide your IP address. Valid options are:
            - "tor": Uses the Tor network. Tor should be running in
              the background on port 9050.
            - dict: A dictionary with the proxy to use. The dict should be
              a mapping of supported protocols to proxy addresses. For example::

                  {
                      'http': 'http://10.10.1.10:3128',
                      'https': 'http://10.10.1.10:1080',
                  }

            - list(dict): A list of proxies to choose from. A different proxy will
              be selected from this list after failed requests, allowing rotating
              proxies.
            - callable: A function that returns a valid proxy. This function will
              be called after failed requests, allowing rotating proxies.
    no_cache : bool
        If True, will not use cached data.
    no_store : bool
        If True, will not store downloaded data.
    data_dir : Path
        Path to directory where data will be cached.
```

2.1.1 ELO scores for all teams at specified date

[4]:
```
current_elo = elo.read_by_date()
current_elo.head()
```

[4]:
```
             rank country  level          elo       from         to  \
team
Liverpool     1.0     ENG      1  2047.083862 2022-04-20 2022-04-24
Man City      2.0     ENG      1  2037.059937 2022-04-21 2022-04-23
Bayern        3.0     GER      1  1984.775391 2022-04-18 2022-04-23
Real Madrid   4.0     ESP      1  1969.584351 2022-04-21 2022-04-26
Chelsea       5.0     ENG      1  1921.101440 2022-04-21 2022-04-24

                        league
```

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```
team
Liverpool    ENG-Premier League
Man City     ENG-Premier League
Bayern           GER-Bundesliga
Real Madrid         ESP-La Liga
Chelsea      ENG-Premier League
```

2.1.2 Full ELO history for one club

[5]:
```
barca_elo = elo.read_team_history("Barcelona")
barca_elo.head()
```

[5]:
```
            rank       team country  level          elo         to
from
1939-10-22   NaN  Barcelona     ESP      1  1636.704590 1939-12-03
1939-12-04   NaN  Barcelona     ESP      1  1626.102173 1939-12-10
1939-12-11   NaN  Barcelona     ESP      1  1636.728271 1939-12-17
1939-12-18   NaN  Barcelona     ESP      1  1646.951660 1939-12-24
1939-12-25   NaN  Barcelona     ESP      1  1637.424316 1939-12-31
```

doc/datasources/ClubElo.ipynb ends here.

The following section was generated from doc/datasources/ESPN.ipynb

[2]:
```
import soccerdata as sd
```

2.2 ESPN

[3]:
```
espn = sd.ESPN(leagues="ENG-Premier League", seasons=2021)
print(espn.__doc__)
```

```
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/_common.py:466:␣
↪UserWarning: Season id "2021" is ambiguous: interpreting as "20-21"
  warnings.warn(msg)
```

```
Provides pd.DataFrames from JSON api available at http://site.api.espn.com.

    Data will be downloaded as necessary and cached locally in
    ``~/soccerdata/data/ESPN``.

    Parameters
    ----------
    leagues : string or iterable, optional
        IDs of leagues to include.

    seasons : string, int or list, optional
        Seasons to include. Supports multiple formats.
        Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
    proxy : 'tor' or or dict or list(dict) or callable, optional
        Use a proxy to hide your IP address. Valid options are:
```

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```
            - "tor": Uses the Tor network. Tor should be running in
              the background on port 9050.
            - dict: A dictionary with the proxy to use. The dict should be
              a mapping of supported protocols to proxy addresses. For example::

                  {
                      'http': 'http://10.10.1.10:3128',
                      'https': 'http://10.10.1.10:1080',
                  }

            - list(dict): A list of proxies to choose from. A different proxy will
              be selected from this list after failed requests, allowing rotating
              proxies.
            - callable: A function that returns a valid proxy. This function will
              be called after failed requests, allowing rotating proxies.
    no_cache : bool
        If True, will not use cached data.
    no_store : bool
        If True, will not store downloaded data.
    data_dir : Path
        Path to directory where data will be cached.
```

2.2.1 Game schedule

[4]:
```
epl_schedule = espn.read_schedule()
epl_schedule.head()
```

[4]:
```
                                                                                ␣
↪  date  \
league             season game
ENG-Premier League 2021   2019-08-09 Liverpool-Norwich City           2019-08-09 19:00:
↪00+00:00
                          2019-08-10 AFC Bournemouth-Sheffield United 2019-08-10 14:00:
↪00+00:00
                          2019-08-10 Burnley-Southampton              2019-08-10 14:00:
↪00+00:00
                          2019-08-10 Crystal Palace-Everton           2019-08-10 14:00:
↪00+00:00
                          2019-08-10 Tottenham Hotspur-Aston Villa    2019-08-10 16:30:
↪00+00:00

                                                                                 home_team␣
↪ \
league             season game
ENG-Premier League 2021   2019-08-09 Liverpool-Norwich City                    Liverpool
                          2019-08-10 AFC Bournemouth-Sheffield United    AFC Bournemouth
                          2019-08-10 Burnley-Southampton                         Burnley
                          2019-08-10 Crystal Palace-Everton                Crystal Palace
                          2019-08-10 Tottenham Hotspur-Aston Villa     Tottenham Hotspur
```

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```
                                                                    away_team ␣
↪\
league              season game
ENG-Premier League 2021   2019-08-09 Liverpool-Norwich City               Norwich City
                          2019-08-10 AFC Bournemouth-Sheffield United  Sheffield United
                          2019-08-10 Burnley-Southampton                    Southampton
                          2019-08-10 Crystal Palace-Everton                     Everton
                          2019-08-10 Tottenham Hotspur-Aston Villa          Aston Villa

                                                                   game_id  \
league              season game
ENG-Premier League 2021   2019-08-09 Liverpool-Norwich City             541844
                          2019-08-10 AFC Bournemouth-Sheffield United   541840
                          2019-08-10 Burnley-Southampton                541841
                          2019-08-10 Crystal Palace-Everton             541839
                          2019-08-10 Tottenham Hotspur-Aston Villa      541837

                                                                  league_id
league              season game
ENG-Premier League 2021   2019-08-09 Liverpool-Norwich City               eng.1
                          2019-08-10 AFC Bournemouth-Sheffield United     eng.1
                          2019-08-10 Burnley-Southampton                  eng.1
                          2019-08-10 Crystal Palace-Everton               eng.1
                          2019-08-10 Tottenham Hotspur-Aston Villa        eng.1
```

2.2.2 Match sheet data

[5]:
```
matchsheet = espn.read_matchsheet(match_id=541465)
matchsheet.head()
```

[5]:
```
                                                                        is_
↪home  \
league              season game                                team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa        False
                                                                 West Ham United     True

                                                                              venue  \
league              season game                                team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa      None
                                                                 West Ham United  None

                                                                                  ␣
↪attendance  \
league              season game                                team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa            ␣
↪  0
                                                                 West Ham United          ␣
↪  0

                                                                                    ␣
↪capacity  \
```

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```
league             season game                                  team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa         None
                                                                 West Ham United     None


                                                                                          ␣
↪                                  roster  \
league             season game                                  team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa      [{
↪'active': True, 'starter': True, 'jersey': '...
                                                                 West Ham United  [{
↪'active': True, 'starter': True, 'jersey': '...

                                                                                      fouls_
↪committed  \
league             season game                                  team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa            ␣
↪     16
                                                                 West Ham United        ␣
↪     13

                                                                                      yellow_
↪cards  \
league             season game                                  team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa            ␣
↪    2
                                                                 West Ham United        ␣
↪    1

                                                                                      red_
↪cards  \
league             season game                                  team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa            ␣
↪0
                                                                 West Ham United        ␣
↪0


                                                                                         ␣
↪offsides  \
league             season game                                  team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa            0
                                                                 West Ham United        1

                                                                                      won_
↪corners  \
league             season game                                  team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa            ␣
↪   0
                                                                 West Ham United        ␣
↪   7


                                                                                      saves  \
league             season game                                  team
```

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```
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa         3
                                                                 West Ham United     0


                                                                                    ␣
↪possession_pct  \
league             season game                                 team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa          ␣
↪    63
                                                                 West Ham United       ␣
↪    37

                                                                                 total_
↪shots  \
league             season game                                 team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa          ␣
↪ 10
                                                                 West Ham United       ␣
↪ 13

                                                                                 shots_
↪on_target
league             season game                                 team
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa          ␣
↪      1
                                                                 West Ham United       ␣
↪      4
```

2.2.3 Line ups

[6]:
```
lineups = espn.read_lineup(match_id=541465)
lineups.head()
```

[6]:
```
                                                                                    ␣
↪       is_home  \
league             season game                                 team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi       False
                                                                                Conor␣
↪Hourihane      False
                                                                                Douglas␣
↪Luiz         False
                                                                                Ezri Konsa ␣
↪         False
                                                                                Frédéric␣
↪Guilbert    False


                                                                                    ␣
↪                    position  \
league             season game                                 team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi                 Substitute
```

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```
                                                                                Conor␣
↪Hourihane    Center Left Midfielder
                                                                                Douglas␣
↪Luiz         Defensive Midfielder
                                                                                Ezri Konsa ␣
↪        Center Right Defender
                                                                                Frédéric␣
↪Guilbert              Right Back

                                                                                                ␣
↪      formation_place  \
league             season game                                 team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi                   0
                                                                                Conor␣
↪Hourihane                10
                                                                                Douglas␣
↪Luiz                     4
                                                                                Ezri Konsa ␣
↪                    5
                                                                                Frédéric␣
↪Guilbert                2

                                                                                                ␣
↪      sub_in  \
league             season game                                 team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi        90
                                                                                Conor␣
↪Hourihane    start
                                                                                Douglas␣
↪Luiz       start
                                                                                Ezri Konsa ␣
↪       start
                                                                                Frédéric␣
↪Guilbert  start

                                                                                                ␣
↪      sub_out  \
league             season game                                 team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi        end
                                                                                Conor␣
↪Hourihane        76
                                                                                Douglas␣
↪Luiz          end
                                                                                Ezri Konsa ␣
↪          end
                                                                                Frédéric␣
↪Guilbert      76

                                                                                                ␣
```

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```
↪       appearances  \
league             season game                                    team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi             1.0
                                                                             Conor␣
↪Hourihane            1.0
                                                                             Douglas␣
↪Luiz              1.0
                                                                             Ezri Konsa ␣
↪               1.0
                                                                             Frédéric␣
↪Guilbert          1.0


                                                                                    ␣
↪       fouls_committed  \
league             season game                                    team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi                 0.0
                                                                             Conor␣
↪Hourihane               0.0
                                                                             Douglas␣
↪Luiz                  2.0
                                                                             Ezri Konsa ␣
↪                  0.0
                                                                             Frédéric␣
↪Guilbert              1.0


                                                                                    ␣
↪       fouls_suffered  \
league             season game                                    team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi                 0.0
                                                                             Conor␣
↪Hourihane               1.0
                                                                             Douglas␣
↪Luiz                  2.0
                                                                             Ezri Konsa ␣
↪                  0.0
                                                                             Frédéric␣
↪Guilbert              1.0


                                                                                    ␣
↪       own_goals  \
league             season game                                    team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi           0.0
                                                                             Conor␣
↪Hourihane         0.0
                                                                             Douglas␣
↪Luiz              0.0
                                                                             Ezri Konsa ␣
↪             0.0
```

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```
                                                                                Frédéric␣
↪Guilbert        0.0

                                                                                                ␣
↪       red_cards  \
league             season game                                  team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi           0.0
                                                                                Conor␣
↪Hourihane          0.0
                                                                                Douglas␣
↪Luiz             0.0
                                                                                Ezri Konsa ␣
↪             0.0
                                                                                Frédéric␣
↪Guilbert        0.0

                                                                                                ␣
↪       sub_ins  \
league             season game                                  team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi         1.0
                                                                                Conor␣
↪Hourihane        0.0
                                                                                Douglas␣
↪Luiz           0.0
                                                                                Ezri Konsa ␣
↪           0.0
                                                                                Frédéric␣
↪Guilbert      0.0

                                                                                                ␣
↪       yellow_cards  \
league             season game                                  team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi              0.0
                                                                                Conor␣
↪Hourihane             0.0
                                                                                Douglas␣
↪Luiz                0.0
                                                                                Ezri Konsa ␣
↪                0.0
                                                                                Frédéric␣
↪Guilbert           0.0

                                                                                                ␣
↪       goal_assists  \
league             season game                                  team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi              0.0
                                                                                Conor␣
↪Hourihane             0.0
```

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```
                                                                                Douglas␣
↪Luiz               0.0
                                                                                Ezri Konsa ␣
↪                0.0
                                                                                Frédéric␣
↪Guilbert           0.0


↪       shots_on_target  \
league             season game                                  team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi                 0.0
                                                                                Conor␣
↪Hourihane               0.0
                                                                                Douglas␣
↪Luiz                  0.0
                                                                                Ezri Konsa ␣
↪                   0.0
                                                                                Frédéric␣
↪Guilbert              0.0


↪       total_goals  \
league             season game                                  team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi              0.0
                                                                                Conor␣
↪Hourihane            0.0
                                                                                Douglas␣
↪Luiz               0.0
                                                                                Ezri Konsa ␣
↪                0.0
                                                                                Frédéric␣
↪Guilbert          0.0


↪       total_shots  \
league             season game                                  team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi              0.0
                                                                                Conor␣
↪Hourihane            0.0
                                                                                Douglas␣
↪Luiz               0.0
                                                                                Ezri Konsa ␣
↪                0.0
                                                                                Frédéric␣
↪Guilbert          0.0


↪       goals_conceded  \
league             season game                                  team        player
```

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```
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi                0.0
                                                                                Conor␣
↪Hourihane               0.0
                                                                                Douglas␣
↪Luiz                 1.0
                                                                                Ezri Konsa ␣
↪                  1.0
                                                                                Frédéric␣
↪Guilbert             0.0


↪       saves  \
league              season game                                 team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi       NaN
                                                                                Conor␣
↪Hourihane      NaN
                                                                                Douglas␣
↪Luiz         NaN
                                                                                Ezri Konsa ␣
↪         NaN
                                                                                Frédéric␣
↪Guilbert    NaN


↪       shots_faced  \
league              season game                                 team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi             0.0
                                                                                Conor␣
↪Hourihane            0.0
                                                                                Douglas␣
↪Luiz               0.0
                                                                                Ezri Konsa ␣
↪               0.0
                                                                                Frédéric␣
↪Guilbert          0.0


↪       offsides
league              season game                                 team        player
ENG-Premier League 2021   2020-07-26 West Ham United-Aston Villa Aston Villa Anwar El␣
↪Ghazi          0.0
                                                                                Conor␣
↪Hourihane         0.0
                                                                                Douglas␣
↪Luiz            0.0
                                                                                Ezri Konsa ␣
↪            0.0
                                                                                Frédéric␣
↪Guilbert       0.0
```

doc/datasources/ESPN.ipynb ends here.

The following section was generated from doc/datasources/FBref.ipynb

[3]:
```
import soccerdata as sd
```

2.3 FBref

[4]:
```
fbref = sd.FBref(leagues="ENG-Premier League", seasons=2021)
print(fbref.__doc__)
```

```
Provides pd.DataFrames from data at http://fbref.com.

    Data will be downloaded as necessary and cached locally in
    ``~/soccerdata/data/FBref``.

    Parameters
    ----------
    leagues : string or iterable, optional
        IDs of leagues to include. For efficiently reading data from the Top-5
        European leagues, use "Big 5 European Leagues Combined".
    seasons : string, int or list, optional
        Seasons to include. Supports multiple formats.
        Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
    proxy : 'tor' or dict or list(dict) or callable, optional
        Use a proxy to hide your IP address. Valid options are:
            - "tor": Uses the Tor network. Tor should be running in
              the background on port 9050.
            - dict: A dictionary with the proxy to use. The dict should be
              a mapping of supported protocols to proxy addresses. For example::

                  {
                      'http': 'http://10.10.1.10:3128',
                      'https': 'http://10.10.1.10:1080',
                  }

            - list(dict): A list of proxies to choose from. A different proxy will
              be selected from this list after failed requests, allowing rotating
              proxies.
            - callable: A function that returns a valid proxy. This function will
              be called after failed requests, allowing rotating proxies.
    no_cache : bool
        If True, will not use cached data.
    no_store : bool
        If True, will not store downloaded data.
    data_dir : Path
        Path to directory where data will be cached.
```

```
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/_common.py:471:␣
↪UserWarning: Season id "2021" is ambiguous: interpreting as "20-21"
  warnings.warn(msg, stacklevel=1)
```

2.3.1 Team season stats

[5]:
```
team_season_stats = fbref.read_team_season_stats(stat_type="passing")
team_season_stats.head()
```

[5]:

```
                                    players_used 90s  Total              \
                                                       Cmp    Att  Cmp%
league             season team
ENG-Premier League 2021   Arsenal              29  38  18041  21807  82.7
                          Aston Villa          24  38  12938  16996  76.1
                          Brighton             27  38  15772  19871  79.4
                          Burnley              25  38  10825  15562  69.6
                          Chelsea              27  38  21969  25799  85.2

                                                      Short              \
                                    TotDist PrgDist    Cmp    Att  Cmp%
league             season team
ENG-Premier League 2021   Arsenal    306094   93540   8319   9236  90.1
                          Aston Villa 235927   93009   5729   6654  86.1
                          Brighton   283213   95248   6694   7654  87.5
                          Burnley    196816   82192   5117   6058  84.5
                          Chelsea    360450  112392  10454  11454  91.3

                                    Medium             Long              \
                                       Cmp   Att  Cmp%   Cmp   Att  Cmp%
league             season team
ENG-Premier League 2021   Arsenal     7770  8814  88.2  1453  2621  55.4
                          Aston Villa 5222  6209  84.1  1571  3074  51.1
                          Brighton    6893  7960  86.6  1689  3090  54.7
                          Burnley     3688  4824  76.5  1553  3535  43.9
                          Chelsea     8965  9976  89.9  1667  2703  61.7

                                    Ast   xAG    xA A-xAG   KP   1/3  PPA  \

league             season team
ENG-Premier League 2021   Arsenal    38  35.1  35.3   2.9  332  1377  325
                          Aston Villa 38  37.4  31.4   0.6  403  1086  323
                          Brighton   24  33.2  34.9  -9.2  358  1132  358
                          Burnley    20  27.7  26.9  -7.7  267   923  292
                          Chelsea    38  41.5  37.1  -3.5  448  1441  377

                                    CrsPA  PrgP  \

league             season team
ENG-Premier League 2021   Arsenal      67  1760
                          Aston Villa  76  1420
                          Brighton     80  1516
                          Burnley      80  1012
                          Chelsea      70  1798

                                                                        url

league             season team
```

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```
ENG-Premier League 2021   Arsenal            /en/squads/18bb7c10/2020-2021/Arsenal-Stats
                          Aston Villa     /en/squads/8602292d/2020-2021/Aston-Villa-Stats
                          Brighton      /en/squads/d07537b9/2020-2021/Brighton-and-Hov...
                          Burnley           /en/squads/943e8050/2020-2021/Burnley-Stats
                          Chelsea           /en/squads/cff3d9bb/2020-2021/Chelsea-Stats
```

2.3.2 Team match stats

[6]:
```
team_match_stats = fbref.read_team_match_stats(stat_type="schedule", team="Manchester␣
↪City")
team_match_stats.head()
```

[6]:
```
                                                                                ␣
↪ date  \
league              season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City         2020-
↪09-21
                                          2020-09-27 Manchester City-Leicester City 2020-
↪09-27
                                          2020-10-03 Leeds United-Manchester City   2020-
↪10-03
                                          2020-10-17 Manchester City-Arsenal        2020-
↪10-17
                                          2020-10-24 West Ham-Manchester City       2020-
↪10-24


                                                                                ␣
↪time  \
league              season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City          20:
↪15:00
                                          2020-09-27 Manchester City-Leicester City  16:
↪30:00
                                          2020-10-03 Leeds United-Manchester City    17:
↪30:00
                                          2020-10-17 Manchester City-Arsenal         17:
↪30:00
                                          2020-10-24 West Ham-Manchester City        12:
↪30:00


                                                                                ␣
↪  round  \
league              season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City         ␣
↪Matchweek 2
                                          2020-09-27 Manchester City-Leicester City ␣
↪Matchweek 3
                                          2020-10-03 Leeds United-Manchester City   ␣
↪Matchweek 4
                                          2020-10-17 Manchester City-Arsenal        ␣
↪Matchweek 5
```

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```
                                       2020-10-24 West Ham-Manchester City       ␣
↪Matchweek 6

                                                                                 day␣
↪ \
league              season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City          Mon
                                          2020-09-27 Manchester City-Leicester City  Sun
                                          2020-10-03 Leeds United-Manchester City    Sat
                                          2020-10-17 Manchester City-Arsenal         Sat
                                          2020-10-24 West Ham-Manchester City        Sat

                                                                                    ␣
↪venue  \
league              season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City          Away
                                          2020-09-27 Manchester City-Leicester City  Home
                                          2020-10-03 Leeds United-Manchester City    Away
                                          2020-10-17 Manchester City-Arsenal         Home
                                          2020-10-24 West Ham-Manchester City        Away

                                                                                    ␣
↪result  \
league              season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City             ␣
↪W
                                          2020-09-27 Manchester City-Leicester City     ␣
↪L
                                          2020-10-03 Leeds United-Manchester City       ␣
↪D
                                          2020-10-17 Manchester City-Arsenal            ␣
↪W
                                          2020-10-24 West Ham-Manchester City           ␣
↪D

                                                                                 GF ␣
↪\
league              season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City           3
                                          2020-09-27 Manchester City-Leicester City   2
                                          2020-10-03 Leeds United-Manchester City     1
                                          2020-10-17 Manchester City-Arsenal          1
                                          2020-10-24 West Ham-Manchester City         1

                                                                                 GA ␣
↪\
league              season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City           1
                                          2020-09-27 Manchester City-Leicester City   5
                                          2020-10-03 Leeds United-Manchester City     1
                                          2020-10-17 Manchester City-Arsenal          0
                                          2020-10-24 West Ham-Manchester City         1
```

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```
                                                                                ␣
↪  opponent  \
league             season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City            ␣
↪    Wolves
                                          2020-09-27 Manchester City-Leicester City ␣
↪Leicester City
                                          2020-10-03 Leeds United-Manchester City     ␣
↪Leeds United
                                          2020-10-17 Manchester City-Arsenal           ␣
↪   Arsenal
                                          2020-10-24 West Ham-Manchester City          ␣
↪  West Ham

                                                                                  xG␣
↪ \
league             season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City          1.9
                                          2020-09-27 Manchester City-Leicester City  0.9
                                          2020-10-03 Leeds United-Manchester City    1.2
                                          2020-10-17 Manchester City-Arsenal         1.3
                                          2020-10-24 West Ham-Manchester City        1.0

                                                                                 xGA␣
↪ \
league             season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City          0.6
                                          2020-09-27 Manchester City-Leicester City  2.9
                                          2020-10-03 Leeds United-Manchester City    2.4
                                          2020-10-17 Manchester City-Arsenal         0.9
                                          2020-10-24 West Ham-Manchester City        0.3

                                                                                ␣
↪Poss  \
league             season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City            65
                                          2020-09-27 Manchester City-Leicester City    72
                                          2020-10-03 Leeds United-Manchester City      49
                                          2020-10-17 Manchester City-Arsenal           58
                                          2020-10-24 West Ham-Manchester City          69

                                                                                ␣
↪Attendance  \
league             season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City            ␣
↪  <NA>
                                          2020-09-27 Manchester City-Leicester City    ␣
↪  <NA>
                                          2020-10-03 Leeds United-Manchester City      ␣
↪  <NA>
                                          2020-10-17 Manchester City-Arsenal           ␣
```

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```
↪  <NA>
                                    2020-10-24 West Ham-Manchester City           ␣
↪  <NA>

                                                                                  ␣
↪    Captain  \
league             season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City          ␣
↪Fernandinho
                                    2020-09-27 Manchester City-Leicester City     ␣
↪Fernandinho
                                    2020-10-03 Leeds United-Manchester City   ␣
↪Kevin De Bruyne
                                    2020-10-17 Manchester City-Arsenal        ␣
↪Raheem Sterling
                                    2020-10-24 West Ham-Manchester City       ␣
↪Raheem Sterling

                                                                             ␣
↪Formation  \
league             season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City          4-
↪2-3-1
                                    2020-09-27 Manchester City-Leicester City   4-
↪2-3-1
                                    2020-10-03 Leeds United-Manchester City      ␣
↪4-3-3
                                    2020-10-17 Manchester City-Arsenal          3-
↪1-4-2
                                    2020-10-24 West Ham-Manchester City          ␣
↪4-3-3

                                                                                  ␣
↪   Referee  \
league             season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City         ␣
↪Andre Marriner
                                    2020-09-27 Manchester City-Leicester City ␣
↪Michael Oliver
                                    2020-10-03 Leeds United-Manchester City       ␣
↪ Mike Dean
                                    2020-10-17 Manchester City-Arsenal        ␣
↪Chris Kavanagh
                                    2020-10-24 West Ham-Manchester City       ␣
↪Anthony Taylor

                                                                                  ␣
↪                              match_report  \
league             season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City          /en/
↪matches/1c17eca3/Wolverhampton-Wanderers-M...
                                    2020-09-27 Manchester City-Leicester City  /en/
```

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```
↪matches/31c2a061/Manchester-City-Leicester...
                                    2020-10-03 Leeds United-Manchester City    /en/
↪matches/5ce15b58/Leeds-United-Manchester-C...
                                    2020-10-17 Manchester City-Arsenal         /en/
↪matches/e95b8546/Manchester-City-Arsenal-O...
                                    2020-10-24 West Ham-Manchester City        /en/
↪matches/2b0c0eca/West-Ham-United-Mancheste...

                                                                              Notes
league             season team            game
ENG-Premier League 2021   Manchester City 2020-09-21 Wolves-Manchester City          <NA>
                                          2020-09-27 Manchester City-Leicester City  <NA>
                                          2020-10-03 Leeds United-Manchester City    <NA>
                                          2020-10-17 Manchester City-Arsenal         <NA>
                                          2020-10-24 West Ham-Manchester City        <NA>
```

2.3.3 Player season stats

[7]:
```
player_season_stats = fbref.read_player_season_stats(stat_type="standard")
player_season_stats.head()
```

[7]:
```
                                                    nation    pos age  \

league             season team    player
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles    ENG  MF,DF  22
                                  Alexandre Lacazette       FRA     FW  29
                                  Bernd Leno                GER     GK  28
                                  Bukayo Saka               ENG  FW,MF  18
                                  Calum Chambers            ENG     DF  25

                                                   born Playing Time  \
                                                                 MP
league             season team    player
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles  1997           11
                                  Alexandre Lacazette     1991           31
                                  Bernd Leno              1992           35
                                  Bukayo Saka             2001           32
                                  Calum Chambers          1995           10

                                                                        \
                                                   Starts   Min   90s
league             season team    player
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles      5   490   5.4
                                  Alexandre Lacazette        22  1923  21.4
                                  Bernd Leno                 35  3131  34.8
                                  Bukayo Saka                30  2553  28.4
                                  Calum Chambers              8   753   8.4

                                                   Performance          \
                                                           Gls Ast G+A
league             season team    player
```

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```
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles          0   0   0
                                  Alexandre Lacazette            13   2  15
                                  Bernd Leno                      0   0   0
                                  Bukayo Saka                     5   3   8
                                  Calum Chambers                  0   2   2

                                                                          \
                                                          G-PK PK PKatt CrdY
league             season team    player
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles    0  0     0    0
                                  Alexandre Lacazette      10  3     3    3
                                  Bernd Leno                0  0     0    0
                                  Bukayo Saka               5  0     0    1
                                  Calum Chambers            0  0     0    0

                                                             Expected       \
                                                          CrdR       xG npxG
league             season team    player
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles    0      0.1  0.1
                                  Alexandre Lacazette       0     11.7  9.3
                                  Bernd Leno                1      0.0  0.0
                                  Bukayo Saka               0      6.9  6.9
                                  Calum Chambers            0      0.4  0.4

                                                                       \
                                                           xAG npxG+xAG
league             season team    player
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles  0.1      0.2
                                  Alexandre Lacazette     2.2     11.5
                                  Bernd Leno              0.0      0.0
                                  Bukayo Saka             4.4     11.3
                                  Calum Chambers          1.1      1.5

                                                          Progression       \
                                                                 PrgC PrgP
league             season team    player
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles          12   24
                                  Alexandre Lacazette             15   55
                                  Bernd Leno                       0    2
                                  Bukayo Saka                     85  101
                                  Calum Chambers                  16   40

                                                             Per 90 Minutes  \
                                                          PrgR            Gls
league             season team    player
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles   21            0.0
                                  Alexandre Lacazette     112           0.61
                                  Bernd Leno                0            0.0
                                  Bukayo Saka             269           0.18
                                  Calum Chambers           49            0.0

                                                                          \
```

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```
                                                          Ast   G+A  G-PK
league             season team    player
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles   0.0   0.0   0.0
                                  Alexandre Lacazette     0.09   0.7  0.47
                                  Bernd Leno               0.0   0.0   0.0
                                  Bukayo Saka             0.11  0.28  0.18
                                  Calum Chambers          0.24  0.24   0.0

                                                                        \
                                                         G+A-PK    xG   xAG
league             season team    player
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles    0.0  0.01  0.02
                                  Alexandre Lacazette      0.56  0.55   0.1
                                  Bernd Leno                0.0   0.0   0.0
                                  Bukayo Saka              0.28  0.24  0.16
                                  Calum Chambers           0.24  0.05  0.13


                                                         xG+xAG  npxG npxG+xAG
league             season team    player
ENG-Premier League 2021   Arsenal Ainsley Maitland-Niles   0.04  0.01     0.04
                                  Alexandre Lacazette      0.65  0.43     0.54
                                  Bernd Leno                0.0   0.0      0.0
                                  Bukayo Saka               0.4  0.24      0.4
                                  Calum Chambers           0.18  0.05     0.18
```

2.3.4 Player match stats

[8]:
```
player_match_stats = fbref.read_player_match_stats(stat_type="passing", match_id=
↪'db261cb0')
player_match_stats.head()
```

[8]:
```
                                                                          ␣
↪       jersey_number  \

league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend             10
                                                                              Cheikhou␣
↪Kouyaté               8
                                                                              Eberechi␣
↪Eze                  25
                                                                              James␣
↪McArthur              18
                                                                              James␣
↪McCarthy              22


                                                                          ␣
↪       nation  \

league             season game                                  team           player
```

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```
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend     ENG
                                                                                Cheikhou␣
↪Kouyaté    SEN
                                                                                Eberechi␣
↪Eze        ENG
                                                                                James␣
↪McArthur      SCO
                                                                                James␣
↪McCarthy      IRL


↪       pos  \

league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend   RM
                                                                                Cheikhou␣
↪Kouyaté  CB
                                                                                Eberechi␣
↪Eze      LM
                                                                                James␣
↪McArthur    CM
                                                                                James␣
↪McCarthy    CM


↪           age  \

league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend   29-058
                                                                                Cheikhou␣
↪Kouyaté  30-266
                                                                                Eberechi␣
↪Eze      22-075
                                                                                James␣
↪McArthur    32-341
                                                                                James␣
↪McCarthy    29-305


↪       min  \

league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend   90
                                                                                Cheikhou␣
↪Kouyaté  90
                                                                                Eberechi␣
↪Eze      10
                                                                                James␣
```

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```
↪McArthur    90
                                                                                  James␣
↪McCarthy    73


                                                                                        ␣
↪       Total  \
                                                                                        ␣
↪         Cmp
league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend     13
                                                                                  Cheikhou␣
↪Kouyaté    11
                                                                                  Eberechi␣
↪Eze         8
                                                                                  James␣
↪McArthur      15
                                                                                  James␣
↪McCarthy      14


                                                                                        ␣
↪            \
                                                                                        ␣
↪       Att
league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend   30
                                                                                  Cheikhou␣
↪Kouyaté  19
                                                                                  Eberechi␣
↪Eze      10
                                                                                  James␣
↪McArthur    32
                                                                                  James␣
↪McCarthy    23


                                                                                        ␣
↪              \
                                                                                        ␣
↪        Cmp%
league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend   43.3
                                                                                  Cheikhou␣
↪Kouyaté  57.9
                                                                                  Eberechi␣
↪Eze      80.0
                                                                                  James␣
↪McArthur    46.9
                                                                                  James␣
↪McCarthy    60.9
```

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```
                                                                                ␣
↪               \
                                                                                ␣
↪       TotDist
league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend      184
                                                                                Cheikhou␣
↪Kouyaté     207
                                                                                Eberechi␣
↪Eze         177
                                                                                James␣
↪McArthur       322
                                                                                James␣
↪McCarthy       281


                                                                                ␣
↪               \
                                                                                ␣
↪       PrgDist
league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend       68
                                                                                Cheikhou␣
↪Kouyaté     109
                                                                                Eberechi␣
↪Eze          46
                                                                                James␣
↪McArthur       159
                                                                                James␣
↪McCarthy        75


                                                                                ␣
↪       Short  \
                                                                                ␣
↪         Cmp
league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend      8
                                                                                Cheikhou␣
↪Kouyaté     3
                                                                                Eberechi␣
↪Eze         2
                                                                                James␣
↪McArthur       2
                                                                                James␣
↪McCarthy       4


                                                                                ␣
↪            \
                                                                                ␣
↪       Att
```

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```
league             season game                                 team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend   11
                                                                              Cheikhou␣
↪Kouyaté   4
                                                                              Eberechi␣
↪Eze       2
                                                                              James␣
↪McArthur     6
                                                                              James␣
↪McCarthy     6


                                                                                    ␣
↪               \
                                                                                    ␣
↪         Cmp%
league             season game                                 team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend    72.7
                                                                              Cheikhou␣
↪Kouyaté   75.0
                                                                              Eberechi␣
↪Eze      100.0
                                                                              James␣
↪McArthur     33.3
                                                                              James␣
↪McCarthy     66.7


                                                                                    ␣
↪       Medium  \
                                                                                    ␣
↪          Cmp
league             season game                                 team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend       4
                                                                              Cheikhou␣
↪Kouyaté      3
                                                                              Eberechi␣
↪Eze          3
                                                                              James␣
↪McArthur       11
                                                                              James␣
↪McCarthy        6


                                                                                    ␣
↪            \
                                                                                    ␣
↪       Att
league             season game                                 team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend    8
                                                                              Cheikhou␣
```

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```
↪Kouyaté   6
                                                                                Eberechi␣
↪Eze       3
                                                                                James␣
↪McArthur    15
                                                                                James␣
↪McCarthy    10

                                                                                        ␣
↪               \
                                                                                        ␣
↪         Cmp%
league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend    50.0
                                                                                Cheikhou␣
↪Kouyaté   50.0
                                                                                Eberechi␣
↪Eze      100.0
                                                                                James␣
↪McArthur     73.3
                                                                                James␣
↪McCarthy     60.0

                                                                                        ␣
↪       Long  \
                                                                                        ␣
↪        Cmp
league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend     1
                                                                                Cheikhou␣
↪Kouyaté    3
                                                                                Eberechi␣
↪Eze        2
                                                                                James␣
↪McArthur      1
                                                                                James␣
↪McCarthy      3

                                                                                        ␣
↪            \
                                                                                        ␣
↪       Att
league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend    6
                                                                                Cheikhou␣
↪Kouyaté   6
                                                                                Eberechi␣
↪Eze       3
                                                                                James␣
```

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```
↪McArthur     7
                                                                                  James␣
↪McCarthy     5


                                                                                        ␣
↪              \
                                                                                        ␣
↪        Cmp%
league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend   16.7
                                                                                  Cheikhou␣
↪Kouyaté  50.0
                                                                                  Eberechi␣
↪Eze      66.7
                                                                                  James␣
↪McArthur    14.3
                                                                                  James␣
↪McCarthy    60.0


                                                                                        ␣
↪       Ast  \

league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend    1
                                                                                  Cheikhou␣
↪Kouyaté   0
                                                                                  Eberechi␣
↪Eze       0
                                                                                  James␣
↪McArthur     0
                                                                                  James␣
↪McCarthy     0


                                                                                        ␣
↪        xAG  \

league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend   0.6
                                                                                  Cheikhou␣
↪Kouyaté  0.0
                                                                                  Eberechi␣
↪Eze      0.0
                                                                                  James␣
↪McArthur    0.4
                                                                                  James␣
↪McCarthy    0.0


                                                                                        ␣
↪         xA  \
```

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```
league             season game                                team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend   0.2
                                                                              Cheikhou␣
↪Kouyaté  0.0
                                                                              Eberechi␣
↪Eze      0.0
                                                                              James␣
↪McArthur    0.0
                                                                              James␣
↪McCarthy    0.1


↪       KP  \

league             season game                                team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend   2
                                                                              Cheikhou␣
↪Kouyaté  0
                                                                              Eberechi␣
↪Eze      0
                                                                              James␣
↪McArthur    1
                                                                              James␣
↪McCarthy    0


↪       1/3  \

league             season game                                team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend    0
                                                                              Cheikhou␣
↪Kouyaté   1
                                                                              Eberechi␣
↪Eze       1
                                                                              James␣
↪McArthur     2
                                                                              James␣
↪McCarthy     0


↪       PPA  \

league             season game                                team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend    1
                                                                              Cheikhou␣
↪Kouyaté   0
                                                                              Eberechi␣
```

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```
↪Eze       0                                                                    James␣
↪McArthur     0                                                                 James␣
↪McCarthy     0

↪       CrsPA  \

league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend      0                                                                 Cheikhou␣
↪Kouyaté     0                                                                   Eberechi␣
↪Eze         0                                                                   James␣
↪McArthur       0                                                                James␣
↪McCarthy       0

↪       PrgP  \

league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend     1                                                                 Cheikhou␣
↪Kouyaté    2                                                                   Eberechi␣
↪Eze        2                                                                   James␣
↪McArthur      3                                                                James␣
↪McCarthy      2

↪         game_id

league             season game                                  team           player
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton Crystal Palace Andros␣
↪Townsend   db261cb0                                                            Cheikhou␣
↪Kouyaté  db261cb0                                                              Eberechi␣
↪Eze      db261cb0                                                              James␣
↪McArthur    db261cb0                                                         James␣
↪McCarthy    db261cb0
```

2.3.5 Game schedule

[9]:
```
epl_schedule = fbref.read_schedule()
epl_schedule.head()
```

[9]:

```
                                                                week  day  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton     1  Sat
                          2020-09-12 Fulham-Arsenal                1  Sat
                          2020-09-12 Liverpool-Leeds United        1  Sat
                          2020-09-12 West Ham-Newcastle Utd        1  Sat
                          2020-09-13 Tottenham-Everton             1  Sun

                                                                     date  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton 2020-09-12
                          2020-09-12 Fulham-Arsenal            2020-09-12
                          2020-09-12 Liverpool-Leeds United    2020-09-12
                          2020-09-12 West Ham-Newcastle Utd    2020-09-12
                          2020-09-13 Tottenham-Everton         2020-09-13

                                                                   time  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton  15:00
                          2020-09-12 Fulham-Arsenal              12:30
                          2020-09-12 Liverpool-Leeds United      17:30
                          2020-09-12 West Ham-Newcastle Utd      20:00
                          2020-09-13 Tottenham-Everton           16:30

                                                                home_team  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton  Crystal Palace
                          2020-09-12 Fulham-Arsenal                     Fulham
                          2020-09-12 Liverpool-Leeds United           Liverpool
                          2020-09-12 West Ham-Newcastle Utd            West Ham
                          2020-09-13 Tottenham-Everton                Tottenham

                                                                home_xg  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton      1.1
                          2020-09-12 Fulham-Arsenal                 0.1
                          2020-09-12 Liverpool-Leeds United         2.7
                          2020-09-12 West Ham-Newcastle Utd         1.0
                          2020-09-13 Tottenham-Everton              1.1

                                                               score  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton   1-0
                          2020-09-12 Fulham-Arsenal               0-3
                          2020-09-12 Liverpool-Leeds United       4-3
                          2020-09-12 West Ham-Newcastle Utd       0-2
                          2020-09-13 Tottenham-Everton            0-1
```

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```
                                                                away_xg  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton      0.9
                          2020-09-12 Fulham-Arsenal                 1.9
                          2020-09-12 Liverpool-Leeds United         0.3
                          2020-09-12 West Ham-Newcastle Utd         1.6
                          2020-09-13 Tottenham-Everton              1.2

                                                                away_team  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton    Southampton
                          2020-09-12 Fulham-Arsenal                   Arsenal
                          2020-09-12 Liverpool-Leeds United       Leeds United
                          2020-09-12 West Ham-Newcastle Utd      Newcastle Utd
                          2020-09-13 Tottenham-Everton                Everton

                                                                attendance  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton        <NA>
                          2020-09-12 Fulham-Arsenal                   <NA>
                          2020-09-12 Liverpool-Leeds United           <NA>
                          2020-09-12 West Ham-Newcastle Utd           <NA>
                          2020-09-13 Tottenham-Everton                <NA>

                                                                                ␣
↪venue  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton              Selhurst␣
↪Park
                          2020-09-12 Fulham-Arsenal                        Craven␣
↪Cottage
                          2020-09-12 Liverpool-Leeds United                      ␣
↪Anfield
                          2020-09-12 West Ham-Newcastle Utd                London␣
↪Stadium
                          2020-09-13 Tottenham-Everton           Tottenham Hotspur␣
↪Stadium

                                                                       referee  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton    Jonathan Moss
                          2020-09-12 Fulham-Arsenal                Chris Kavanagh
                          2020-09-12 Liverpool-Leeds United        Michael Oliver
                          2020-09-12 West Ham-Newcastle Utd        Stuart Attwell
                          2020-09-13 Tottenham-Everton            Martin Atkinson

                                                                                ␣
↪             match_report  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton  /en/matches/db261cb0/
↪Crystal-Palace-Southampto...
                          2020-09-12 Fulham-Arsenal              /en/matches/bf52349b/
```

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```
↪Fulham-Arsenal-September-...
                        2020-09-12 Liverpool-Leeds United      /en/matches/21b58926/
↪Liverpool-Leeds-United-Se...
                        2020-09-12 West Ham-Newcastle Utd      /en/matches/78495ced/
↪West-Ham-United-Newcastle...
                        2020-09-13 Tottenham-Everton           /en/matches/fc7f9aa1/
↪Tottenham-Hotspur-Everton...

                                                               notes  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton   <NA>
                          2020-09-12 Fulham-Arsenal               <NA>
                          2020-09-12 Liverpool-Leeds United       <NA>
                          2020-09-12 West Ham-Newcastle Utd       <NA>
                          2020-09-13 Tottenham-Everton            <NA>

                                                                game_id
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton  db261cb0
                          2020-09-12 Fulham-Arsenal              bf52349b
                          2020-09-12 Liverpool-Leeds United      21b58926
                          2020-09-12 West Ham-Newcastle Utd      78495ced
                          2020-09-13 Tottenham-Everton           fc7f9aa1
```

2.3.6 Line ups

[10]:
```
lineups = fbref.read_lineup(match_id='db261cb0')
lineups.head()
```

[10]:
```
                                                          jersey_number  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton            31
                          2020-09-12 Crystal Palace-Southampton             2
                          2020-09-12 Crystal Palace-Southampton             6
                          2020-09-12 Crystal Palace-Southampton             8
                          2020-09-12 Crystal Palace-Southampton             9

                                                                       player  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton    Vicente Guaita
                          2020-09-12 Crystal Palace-Southampton         Joel Ward
                          2020-09-12 Crystal Palace-Southampton       Scott Dann
                          2020-09-12 Crystal Palace-Southampton  Cheikhou Kouyaté
                          2020-09-12 Crystal Palace-Southampton      Jordan Ayew

                                                                         team  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton  Crystal Palace
                          2020-09-12 Crystal Palace-Southampton  Crystal Palace
                          2020-09-12 Crystal Palace-Southampton  Crystal Palace
                          2020-09-12 Crystal Palace-Southampton  Crystal Palace
```

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```
                        2020-09-12 Crystal Palace-Southampton  Crystal Palace

                                                                is_starter  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton       True
                          2020-09-12 Crystal Palace-Southampton       True
                          2020-09-12 Crystal Palace-Southampton       True
                          2020-09-12 Crystal Palace-Southampton       True
                          2020-09-12 Crystal Palace-Southampton       True

                                                                position  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton       GK
                          2020-09-12 Crystal Palace-Southampton       RB
                          2020-09-12 Crystal Palace-Southampton       CB
                          2020-09-12 Crystal Palace-Southampton       CB
                          2020-09-12 Crystal Palace-Southampton       FW

                                                                 minutes_played
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton              90
                          2020-09-12 Crystal Palace-Southampton              90
                          2020-09-12 Crystal Palace-Southampton              90
                          2020-09-12 Crystal Palace-Southampton              90
                          2020-09-12 Crystal Palace-Southampton              90
```

2.3.7 Events

[11]:
```
events = fbref.read_events(match_id='db261cb0')
events.head()
```

[11]:
```
                                                                    team  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton  Crystal Palace
                          2020-09-12 Crystal Palace-Southampton  Crystal Palace
                          2020-09-12 Crystal Palace-Southampton     Southampton
                          2020-09-12 Crystal Palace-Southampton     Southampton
                          2020-09-12 Crystal Palace-Southampton  Crystal Palace

                                                                minute score  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton     13   1:0
                          2020-09-12 Crystal Palace-Southampton     41   1:0
                          2020-09-12 Crystal Palace-Southampton     46   1:0
                          2020-09-12 Crystal Palace-Southampton     51   1:0
                          2020-09-12 Crystal Palace-Southampton     58   1:0

                                                                        player1  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton       Wilfried Zaha
                          2020-09-12 Crystal Palace-Southampton     Jeffrey Schlupp
```

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```
                         2020-09-12 Crystal Palace-Southampton  Jannik Vestergaard
                         2020-09-12 Crystal Palace-Southampton  Kyle Walker-Peters
                         2020-09-12 Crystal Palace-Southampton      James McCarthy

                                                                          player2  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton  Andros Townsend
                         2020-09-12 Crystal Palace-Southampton             None
                         2020-09-12 Crystal Palace-Southampton     Jan Bednarek
                         2020-09-12 Crystal Palace-Southampton             None
                         2020-09-12 Crystal Palace-Southampton             None

                                                                     event_type
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton           goal
                         2020-09-12 Crystal Palace-Southampton    yellow_card
                         2020-09-12 Crystal Palace-Southampton  substitute_in
                         2020-09-12 Crystal Palace-Southampton    yellow_card
                         2020-09-12 Crystal Palace-Southampton    yellow_card
```

2.3.8 Shot events

[12]:
```
shots = fbref.read_shot_events(match_id='db261cb0')
shots.head()
```

[12]:
```
                                                          minute  \

league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton      4
                         2020-09-12 Crystal Palace-Southampton     13
                         2020-09-12 Crystal Palace-Southampton     32
                         2020-09-12 Crystal Palace-Southampton     36
                         2020-09-12 Crystal Palace-Southampton     46

                                                                 player  \

league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton     Jack Stephens
                         2020-09-12 Crystal Palace-Southampton     Wilfried Zaha
                         2020-09-12 Crystal Palace-Southampton        Danny Ings
                         2020-09-12 Crystal Palace-Southampton  Cheikhou Kouyaté
                         2020-09-12 Crystal Palace-Southampton    Nathan Redmond

                                                                    team  \

league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton     Southampton
                         2020-09-12 Crystal Palace-Southampton  Crystal Palace
                         2020-09-12 Crystal Palace-Southampton     Southampton
                         2020-09-12 Crystal Palace-Southampton  Crystal Palace
                         2020-09-12 Crystal Palace-Southampton     Southampton
```

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```
                                                                xG  PSxG  \

league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton  0.07  0.09
                          2020-09-12 Crystal Palace-Southampton  0.44  0.73
                          2020-09-12 Crystal Palace-Southampton  0.04  0.12
                          2020-09-12 Crystal Palace-Southampton  0.15  0.09
                          2020-09-12 Crystal Palace-Southampton  0.07  0.03

                                                              outcome  \

league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton   Saved
                          2020-09-12 Crystal Palace-Southampton    Goal
                          2020-09-12 Crystal Palace-Southampton   Saved
                          2020-09-12 Crystal Palace-Southampton   Saved
                          2020-09-12 Crystal Palace-Southampton   Saved

                                                              distance  \

league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton       10
                          2020-09-12 Crystal Palace-Southampton        9
                          2020-09-12 Crystal Palace-Southampton       10
                          2020-09-12 Crystal Palace-Southampton       11
                          2020-09-12 Crystal Palace-Southampton       14

                                                                body_part  \

league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton        Head
                          2020-09-12 Crystal Palace-Southampton  Right Foot
                          2020-09-12 Crystal Palace-Southampton        Head
                          2020-09-12 Crystal Palace-Southampton  Right Foot
                          2020-09-12 Crystal Palace-Southampton  Right Foot

                                                                notes  \

league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton    <NA>
                          2020-09-12 Crystal Palace-Southampton  Volley
                          2020-09-12 Crystal Palace-Southampton    <NA>
                          2020-09-12 Crystal Palace-Southampton    <NA>
                          2020-09-12 Crystal Palace-Southampton    <NA>

                                                                           SCA 1  \
                                                                          player
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton   James Ward-Prowse
                          2020-09-12 Crystal Palace-Southampton     Andros Townsend
                          2020-09-12 Crystal Palace-Southampton  Kyle Walker-Peters
```

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```
                        2020-09-12 Crystal Palace-Southampton     Andros Townsend
                        2020-09-12 Crystal Palace-Southampton           Che Adams

                                                                                \
                                                                          event
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton  Pass (Dead)
                          2020-09-12 Crystal Palace-Southampton  Pass (Live)
                          2020-09-12 Crystal Palace-Southampton  Pass (Live)
                          2020-09-12 Crystal Palace-Southampton  Pass (Dead)
                          2020-09-12 Crystal Palace-Southampton  Pass (Live)

                                                                             SCA 2  \
                                                                           player
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton  Kyle Walker-Peters
                          2020-09-12 Crystal Palace-Southampton      James McCarthy
                          2020-09-12 Crystal Palace-Southampton   William Smallbone
                          2020-09-12 Crystal Palace-Southampton       Wilfried Zaha
                          2020-09-12 Crystal Palace-Southampton          Danny Ings


                                                                           event
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton   Pass (Dead)
                          2020-09-12 Crystal Palace-Southampton  Interception
                          2020-09-12 Crystal Palace-Southampton   Pass (Live)
                          2020-09-12 Crystal Palace-Southampton        Fouled
                          2020-09-12 Crystal Palace-Southampton   Pass (Live)
```

doc/datasources/FBref.ipynb ends here.

The following section was generated from doc/datasources/FiveThirtyEight.ipynb

[3]:
```
import soccerdata as sd
```

2.4 FiveThirtyEight

[4]:
```
five38 = sd.FiveThirtyEight(leagues="ENG-Premier League", seasons=2021)
print(five38.__doc__)
```

```
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/_common.py:466:␣
↪UserWarning: Season id "2021" is ambiguous: interpreting as "20-21"
  warnings.warn(msg)
```

```
Provides pd.DataFrames from fivethirtyeight's "Club Soccer Predictions" project.

    Data will be downloaded as necessary and cached locally in
    ``~/soccerdata/data/FiveThirtyEight``.

    Original project and background info:
```

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```
    https://projects.fivethirtyeight.com/soccer-predictions/ and
    https://fivethirtyeight.com/features/how-our-club-soccer-projections-work/


    Parameters
    ----------
    leagues : string or iterable, optional
        IDs of Leagues to include.
    seasons : string, int or list, optional
        Seasons to include. Supports multiple formats.
        Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
    proxy : 'tor' or or dict or list(dict) or callable, optional
        Use a proxy to hide your IP address. Valid options are:
            - "tor": Uses the Tor network. Tor should be running in
              the background on port 9050.
            - dict: A dictionary with the proxy to use. The dict should be
              a mapping of supported protocols to proxy addresses. For example::

                  {
                      'http': 'http://10.10.1.10:3128',
                      'https': 'http://10.10.1.10:1080',
                  }

            - list(dict): A list of proxies to choose from. A different proxy will
              be selected from this list after failed requests, allowing rotating
              proxies.
            - callable: A function that returns a valid proxy. This function will
              be called after failed requests, allowing rotating proxies.
    no_cache : bool
        If True, will not use cached data.
    no_store : bool
        If True, will not store downloaded data.
    data_dir : Path
        Path to directory where data will be cached.
```

2.4.1 Game schedule and predicted results

[5]:
```
epl_schedule = five38.read_games()
epl_schedule.head()
```

[5]:
```
                                                                                ␣
↪date  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton 2020-09-12 14:00:00+00:00
                          2020-09-12 Fulham-Arsenal             2020-09-12 11:30:00+00:00
                          2020-09-12 Liverpool-Leeds United     2020-09-12 16:30:00+00:00
                          2020-09-12 West Ham United-Newcastle  2020-09-12 19:00:00+00:00
                          2020-09-13 Tottenham Hotspur-Everton  2020-09-13 15:30:00+00:00

                                                                status   leg  \
```

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```
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton   post  None
                          2020-09-12 Fulham-Arsenal               post  None
                          2020-09-12 Liverpool-Leeds United       post  None
                          2020-09-12 West Ham United-Newcastle    post  None
                          2020-09-13 Tottenham Hotspur-Everton    post  None

                                                                        home_team  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton     Crystal Palace
                          2020-09-12 Fulham-Arsenal                        Fulham
                          2020-09-12 Liverpool-Leeds United             Liverpool
                          2020-09-12 West Ham United-Newcastle     West Ham United
                          2020-09-13 Tottenham Hotspur-Everton   Tottenham Hotspur

                                                                     away_team  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton   Southampton
                          2020-09-12 Fulham-Arsenal                   Arsenal
                          2020-09-12 Liverpool-Leeds United      Leeds United
                          2020-09-12 West Ham United-Newcastle      Newcastle
                          2020-09-13 Tottenham Hotspur-Everton        Everton

                                                                    home_id  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton      384
                          2020-09-12 Fulham-Arsenal                 370
                          2020-09-12 Liverpool-Leeds United         364
                          2020-09-12 West Ham United-Newcastle      371
                          2020-09-13 Tottenham Hotspur-Everton      367

                                                                    away_id  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton      376
                          2020-09-12 Fulham-Arsenal                 359
                          2020-09-12 Liverpool-Leeds United         357
                          2020-09-12 West Ham United-Newcastle      361
                          2020-09-13 Tottenham Hotspur-Everton      368

                                                                  home_code  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton       CRY
                          2020-09-12 Fulham-Arsenal                  FUL
                          2020-09-12 Liverpool-Leeds United          LIV
                          2020-09-12 West Ham United-Newcastle       WHU
                          2020-09-13 Tottenham Hotspur-Everton       TOT

                                                                  away_code  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton       SOU
                          2020-09-12 Fulham-Arsenal                  ARS
                          2020-09-12 Liverpool-Leeds United          LEE
```

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```
                        2020-09-12 West Ham United-Newcastle        NEW
                        2020-09-13 Tottenham Hotspur-Everton        EVE

                                                                 prob_home  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton    0.36979
                          2020-09-12 Fulham-Arsenal                0.28167
                          2020-09-12 Liverpool-Leeds United        0.83582
                          2020-09-12 West Ham United-Newcastle     0.48865
                          2020-09-13 Tottenham Hotspur-Everton     0.50235

                                                                 prob_away  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton    0.35311
                          2020-09-12 Fulham-Arsenal                0.46081
                          2020-09-12 Liverpool-Leeds United        0.04384
                          2020-09-12 West Ham United-Newcastle     0.25556
                          2020-09-13 Tottenham Hotspur-Everton     0.24434

                                                                 prob_tie  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton   0.27710
                          2020-09-12 Fulham-Arsenal               0.25752
                          2020-09-12 Liverpool-Leeds United       0.12034
                          2020-09-12 West Ham United-Newcastle    0.25579
                          2020-09-13 Tottenham Hotspur-Everton    0.25331

                                                                round  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton  None
                          2020-09-12 Fulham-Arsenal              None
                          2020-09-12 Liverpool-Leeds United      None
                          2020-09-12 West Ham United-Newcastle   None
                          2020-09-13 Tottenham Hotspur-Everton   None

                                                                matchday  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton     None
                          2020-09-12 Fulham-Arsenal                None
                          2020-09-12 Liverpool-Leeds United        None
                          2020-09-12 West Ham United-Newcastle     None
                          2020-09-13 Tottenham Hotspur-Everton     None

                                                                 score_home  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton           1
                          2020-09-12 Fulham-Arsenal                      0
                          2020-09-12 Liverpool-Leeds United              4
                          2020-09-12 West Ham United-Newcastle           0
                          2020-09-13 Tottenham Hotspur-Everton           0

                                                                 score_away  \
```

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```
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton           0
                          2020-09-12 Fulham-Arsenal                      3
                          2020-09-12 Liverpool-Leeds United              3
                          2020-09-12 West Ham United-Newcastle           2
                          2020-09-13 Tottenham Hotspur-Everton           1

                                                                  adj_score_home  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton            1.05
                          2020-09-12 Fulham-Arsenal                       0.00
                          2020-09-12 Liverpool-Leeds United               4.20
                          2020-09-12 West Ham United-Newcastle            0.00
                          2020-09-13 Tottenham Hotspur-Everton            0.00

                                                                  adj_score_away  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton           0.000
                          2020-09-12 Fulham-Arsenal                      3.150
                          2020-09-12 Liverpool-Leeds United              3.150
                          2020-09-12 West Ham United-Newcastle           1.666
                          2020-09-13 Tottenham Hotspur-Everton           1.050

                                                                  chances_home  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton         1.507
                          2020-09-12 Fulham-Arsenal                    0.141
                          2020-09-12 Liverpool-Leeds United            3.328
                          2020-09-12 West Ham United-Newcastle         0.973
                          2020-09-13 Tottenham Hotspur-Everton         1.029

                                                                  chances_away  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton         1.160
                          2020-09-12 Fulham-Arsenal                    2.989
                          2020-09-12 Liverpool-Leeds United            0.368
                          2020-09-12 West Ham United-Newcastle         1.475
                          2020-09-13 Tottenham Hotspur-Everton         1.109

                                                                  moves_home  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton       0.943
                          2020-09-12 Fulham-Arsenal                  0.270
                          2020-09-12 Liverpool-Leeds United          3.006
                          2020-09-12 West Ham United-Newcastle       1.103
                          2020-09-13 Tottenham Hotspur-Everton       1.316

                                                                  moves_away  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton       1.652
                          2020-09-12 Fulham-Arsenal                  1.528
                          2020-09-12 Liverpool-Leeds United          0.747
```

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```
                         2020-09-12 West Ham United-Newcastle        1.860
                         2020-09-13 Tottenham Hotspur-Everton        1.110

                                                                aggregate_winner  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton             None
                         2020-09-12 Fulham-Arsenal                       None
                         2020-09-12 Liverpool-Leeds United               None
                         2020-09-12 West Ham United-Newcastle            None
                         2020-09-13 Tottenham Hotspur-Everton            None

                                                                shootout_winner
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton           None
                         2020-09-12 Fulham-Arsenal                     None
                         2020-09-12 Liverpool-Leeds United             None
                         2020-09-12 West Ham United-Newcastle          None
                         2020-09-13 Tottenham Hotspur-Everton          None
```

2.4.2 Forecasted league table

[6]:
```
forecasts = five38.read_forecasts()
forecasts.head()
```

[6]:
```
                                                                    code  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                 ARS
                                                   Aston Villa              AVL
                                                   Brighton and Hove Albion BHA
                                                   Burnley                  BRN
                                                   Chelsea                  CHE

                                                                    current_
↪losses  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                       ␣
↪0.0
                                                   Aston Villa                    ␣
↪0.0
                                                   Brighton and Hove Albion       ␣
↪0.0
                                                   Burnley                        ␣
↪0.0
                                                   Chelsea                        ␣
↪0.0

                                                                    current_
↪points  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                       ␣
↪0.0
```

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```
                                                Aston Villa                          ␣
↪0.0
                                                Brighton and Hove Albion             ␣
↪0.0
                                                Burnley                              ␣
↪0.0
                                                Chelsea                              ␣
↪0.0

                                                                                current_
↪ties  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                           0.0
                                                Aston Villa                          0.0
                                                Brighton and Hove Albion             0.0
                                                Burnley                              0.0
                                                Chelsea                              0.0

                                                                                current_
↪wins  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                           0.0
                                                Aston Villa                          0.0
                                                Brighton and Hove Albion             0.0
                                                Burnley                              0.0
                                                Chelsea                              0.0

                                                                                d_rating  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     1.33114
                                                Aston Villa                  1.52263
                                                Brighton and Hove Albion     1.45713
                                                Burnley                      1.41912
                                                Chelsea                      1.16934

                                                                                global_d  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.68339
                                                Aston Villa                  0.87488
                                                Brighton and Hove Albion     0.80938
                                                Burnley                      0.77137
                                                Chelsea                      0.52160

                                                                                global_o  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     2.13421
                                                Aston Villa                  1.77744
                                                Brighton and Hove Albion     1.77377
                                                Burnley                      1.77961
                                                Chelsea                      2.51615

                                                                                global_
```

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```
↪rating  \
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                       77.
↪16360
                                                    Aston Villa                   66.
↪48339
                                                    Brighton and Hove Albion      68.
↪02657
                                                    Burnley                       69.
↪08173
                                                    Chelsea                       85.
↪37204

                                                                                goal_diff  \
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     4.13260
                                                    Aston Villa                -17.57325
                                                    Brighton and Hove Albion   -15.24810
                                                    Burnley                    -13.63310
                                                    Chelsea                     26.57990

                                                                                goals_
↪against  \
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                          49.
↪72715
                                                    Aston Villa                       57.
↪65595
                                                    Brighton and Hove Albion          55.
↪36300
                                                    Burnley                           53.
↪84085
                                                    Chelsea                           42.
↪20305

                                                                                goals_
↪scored  \
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                       53.85975
                                                    Aston Villa                   40.08270
                                                    Brighton and Hove Albion      40.11490
                                                    Burnley                       40.20775
                                                    Chelsea                       68.78295

                                                                                 id  \
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                    359
                                                    Aston Villa                362
                                                    Brighton and Hove Albion   331
                                                    Burnley                    379
                                                    Chelsea                    363
```

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```
                                                                    losses  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                 13.27675
                                                   Aston Villa              17.72125
                                                   Brighton and Hove Albion 17.18525
                                                   Burnley                  16.80205
                                                   Chelsea                   9.34340

                                                                    make_champs␣
↪ \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                    0.16095
                                                   Aston Villa                0.02335
                                                   Brighton and Hove Albion   0.02950
                                                   Burnley                    0.03210
                                                   Chelsea                    0.53090

                                                                    make_europa␣
↪ \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                         0.0
                                                   Aston Villa                      0.0
                                                   Brighton and Hove Albion         0.0
                                                   Burnley                          0.0
                                                   Chelsea                          0.0

                                                                    make_
↪playoffs  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                           0.
↪0
                                                   Aston Villa                        0.
↪0
                                                   Brighton and Hove Albion           0.
↪0
                                                   Burnley                            0.
↪0
                                                   Chelsea                            0.
↪0

                                                                    o_rating  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                  1.48647
                                                   Aston Villa              1.12969
                                                   Brighton and Hove Albion 1.12603
                                                   Burnley                  1.13187
                                                   Chelsea                  1.86841

                                                                     points  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                 55.50395
                                                   Aston Villa              41.66985
```

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```
                                                Brighton and Hove Albion  42.92225
                                                Burnley                   43.86545
                                                Chelsea                   69.17900

                                                                          position_1 ␣
↪\
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.00720
                                                Aston Villa                   0.00030
                                                Brighton and Hove Albion      0.00075
                                                Burnley                       0.00100
                                                Chelsea                       0.06525

                                                                          position_10␣
↪ \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.06905
                                                Aston Villa                   0.05405
                                                Brighton and Hove Albion      0.05475
                                                Burnley                       0.05910
                                                Chelsea                       0.02775

                                                                          position_11␣
↪ \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.06170
                                                Aston Villa                   0.06005
                                                Brighton and Hove Albion      0.06255
                                                Burnley                       0.06525
                                                Chelsea                       0.02295

                                                                          position_12␣
↪ \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.05220
                                                Aston Villa                   0.06500
                                                Brighton and Hove Albion      0.06575
                                                Burnley                       0.06555
                                                Chelsea                       0.01715

                                                                          position_13␣
↪ \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.04835
                                                Aston Villa                   0.06855
                                                Brighton and Hove Albion      0.07025
                                                Burnley                       0.07245
                                                Chelsea                       0.01315

                                                                          position_14␣
↪ \
league             season last_updated             team
```

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```
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                        0.04075
                                                   Aston Villa                    0.07090
                                                   Brighton and Hove Albion       0.07305
                                                   Burnley                        0.06670
                                                   Chelsea                        0.01000

                                                                                  position_15␣
↪ \
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                        0.03595
                                                   Aston Villa                    0.07480
                                                   Brighton and Hove Albion       0.07485
                                                   Burnley                        0.07370
                                                   Chelsea                        0.00735

                                                                                  position_16␣
↪ \
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                        0.03045
                                                   Aston Villa                    0.07685
                                                   Brighton and Hove Albion       0.07690
                                                   Burnley                        0.07325
                                                   Chelsea                        0.00585

                                                                                  position_17␣
↪ \
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                        0.02650
                                                   Aston Villa                    0.07955
                                                   Brighton and Hove Albion       0.07505
                                                   Burnley                        0.07340
                                                   Chelsea                        0.00400

                                                                                  position_18␣
↪ \
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                        0.02035
                                                   Aston Villa                    0.08465
                                                   Brighton and Hove Albion       0.07790
                                                   Burnley                        0.07010
                                                   Chelsea                        0.00230

                                                                                  position_19␣
↪ \
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                        0.01590
                                                   Aston Villa                    0.08315
                                                   Brighton and Hove Albion       0.07590
                                                   Burnley                        0.06735
                                                   Chelsea                        0.00215

                                                                                  position_2 ␣
```

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```
↪\
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.02725
                                                   Aston Villa                  0.00315
                                                   Brighton and Hove Albion     0.00295
                                                   Burnley                      0.00325
                                                   Chelsea                      0.13860

                                                                              position_20␣
↪ \
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.01165
                                                   Aston Villa                  0.08465
                                                   Brighton and Hove Albion     0.06700
                                                   Burnley                      0.06145
                                                   Chelsea                      0.00050

                                                                              position_3 ␣
↪\
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.05280
                                                   Aston Villa                  0.00615
                                                   Brighton and Hove Albion     0.00965
                                                   Burnley                      0.01065
                                                   Chelsea                      0.17560

                                                                              position_4 ␣
↪\
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.07370
                                                   Aston Villa                  0.01375
                                                   Brighton and Hove Albion     0.01615
                                                   Burnley                      0.01720
                                                   Chelsea                      0.15145

                                                                              position_5 ␣
↪\
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.08895
                                                   Aston Villa                  0.02105
                                                   Brighton and Hove Albion     0.02415
                                                   Burnley                      0.02915
                                                   Chelsea                      0.11230

                                                                              position_6 ␣
↪\
league              season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.09120
                                                   Aston Villa                  0.02830
                                                   Brighton and Hove Albion     0.03275
                                                   Burnley                      0.03935
                                                   Chelsea                      0.08610
```

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```
                                                                  position_7 ␣
↪\
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                    0.08990
                                                   Aston Villa                0.03375
                                                   Brighton and Hove Albion   0.04185
                                                   Burnley                    0.04365
                                                   Chelsea                    0.06630

                                                                  position_8 ␣
↪\
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                    0.08340
                                                   Aston Villa                0.04145
                                                   Brighton and Hove Albion   0.04450
                                                   Burnley                    0.05110
                                                   Chelsea                    0.04965

                                                                  position_9 ␣
↪\
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                    0.07275
                                                   Aston Villa                0.04990
                                                   Brighton and Hove Albion   0.05330
                                                   Burnley                    0.05635
                                                   Chelsea                    0.04160

                                                                  promoted  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                       0.0
                                                   Aston Villa                   0.0
                                                   Brighton and Hove Albion      0.0
                                                   Burnley                       0.0
                                                   Chelsea                       0.0

                                                                  relegated  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                   0.04790
                                                   Aston Villa               0.25245
                                                   Brighton and Hove Albion  0.22080
                                                   Burnley                   0.19890
                                                   Chelsea                   0.00495

                                                                  sdr_id  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                  73616
                                                   Aston Villa              73597
                                                   Brighton and Hove Albion 73651
                                                   Burnley                  73618
                                                   Chelsea                  73598
```

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```
                                                                                ties  \
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                   9.3329
                                                   Aston Villa               9.5832
                                                   Brighton and Hove Albion  9.7610
                                                   Burnley                   9.8642
                                                   Chelsea                   8.3954

                                                                           win_league ␣
↪\
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                     0.00720
                                                   Aston Villa                 0.00030
                                                   Brighton and Hove Albion    0.00075
                                                   Burnley                     0.00100
                                                   Chelsea                     0.06525

                                                                              wins
league             season last_updated             team
ENG-Premier League 2021   2020-09-09T14:46:49.136Z Arsenal                   15.39035
                                                   Aston Villa               10.69555
                                                   Brighton and Hove Albion  11.05375
                                                   Burnley                   11.33375
                                                   Chelsea                   20.26120
```

2.4.3 Clinches

[7]:
```
clinches = five38.read_clinches()
clinches.head()
```

[7]:
```
                                              typ                  team
league             season date
ENG-Premier League 2021   2021-02-13   relegated_elim       Manchester City
                          2021-02-17  win_league_elim      Sheffield United
                          2021-02-17  win_league_elim  West Bromwich Albion
                          2021-02-27  win_league_elim               Fulham
                          2021-03-02  win_league_elim             Newcastle
```

doc/datasources/FiveThirtyEight.ipynb ends here.

The following section was generated from doc/datasources/FotMob.ipynb

[1]:
```
import pandas as pd
pd.set_option('display.max_columns', None)
```

[3]:
```
import soccerdata as sd
```

2.5 FotMob

[4]:
```
fotmob = sd.FotMob(leagues='ESP-La Liga', seasons='2022/2023')
print(fotmob.__doc__)
```

```
Provides pd.DataFrames from data available at http://www.fotmob.com.

    Data will be downloaded as necessary and cached locally in
    ``~/soccerdata/data/FotMob``.

    Parameters
    ----------
    leagues : string or iterable, optional
        IDs of Leagues to include.
    seasons : string, int or list, optional
        Seasons to include. Supports multiple formats.
        Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
    proxy : 'tor' or dict or list(dict) or callable, optional
        Use a proxy to hide your IP address. Valid options are:
            - 'tor': Uses the Tor network. Tor should be running in
              the background on port 9050.
            - dict: A dictionary with the proxy to use. The dict should be
              a mapping of supported protocols to proxy addresses. For example::

                  {
                      'http': 'http://10.10.1.10:3128',
                      'https': 'http://10.10.1.10:1080',
                  }

            - list(dict): A list of proxies to choose from. A different proxy will
              be selected from this list after failed requests, allowing rotating
              proxies.
            - callable: A function that returns a valid proxy. This function will
              be called after failed requests, allowing rotating proxies.
    no_cache : bool
        If True, will not use cached data.
    no_store : bool
        If True, will not store downloaded data.
    data_dir : Path
        Path to directory where data will be cached.
```

2.5.1 Read league table

[5]:
```
league_table = fotmob.read_league_table()
league_table.head()
```

[5]:
```
                              team  MP   W  D   L  GF  GA  GD  Pts
league      season
ESP-La Liga 2223          Barcelona  38  28  4   6  70  20  50   88
            2223       Real Madrid  38  24  6   8  75  36  39   78
            2223    Atletico Madrid  38  23  8   7  70  33  37   77
            2223      Real Sociedad  38  21  8   9  51  35  16   71
            2223         Villarreal  38  19  7  12  59  40  19   64
```

2.5.2 Read schedule

[6]:
```
schedule = fotmob.read_schedule()
schedule.head()
```

[6]:
```
                                                  round  week  \
league      season game
ESP-La Liga 2223   2022-08-12 Osasuna-Sevilla              None  None
                   2022-08-13 Barcelona-Rayo Vallecano    None  None
                   2022-08-13 Celta Vigo-Espanyol         None  None
                   2022-08-13 Real Valladolid-Villarreal  None  None
                   2022-08-14 Almeria-Real Madrid         None  None

                                                                    date  \
league      season game
ESP-La Liga 2223   2022-08-12 Osasuna-Sevilla            2022-08-12 19:00:00+00:00
                   2022-08-13 Barcelona-Rayo Vallecano   2022-08-13 19:00:00+00:00
                   2022-08-13 Celta Vigo-Espanyol        2022-08-13 15:00:00+00:00
                   2022-08-13 Real Valladolid-Villarreal 2022-08-13 17:00:00+00:00
                   2022-08-14 Almeria-Real Madrid        2022-08-14 20:00:00+00:00

                                                           home_team  \
league      season game
ESP-La Liga 2223   2022-08-12 Osasuna-Sevilla                 Osasuna
                   2022-08-13 Barcelona-Rayo Vallecano       Barcelona
                   2022-08-13 Celta Vigo-Espanyol           Celta Vigo
                   2022-08-13 Real Valladolid-Villarreal  Real Valladolid
                   2022-08-14 Almeria-Real Madrid              Almeria

                                                          away_team  \
league      season game
ESP-La Liga 2223   2022-08-12 Osasuna-Sevilla                 Sevilla
                   2022-08-13 Barcelona-Rayo Vallecano    Rayo Vallecano
                   2022-08-13 Celta Vigo-Espanyol            Espanyol
                   2022-08-13 Real Valladolid-Villarreal     Villarreal
                   2022-08-14 Almeria-Real Madrid          Real Madrid

                                                        home_score  \
league      season game
```

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```
ESP-La Liga 2223   2022-08-12 Osasuna-Sevilla                   2
                   2022-08-13 Barcelona-Rayo Vallecano          0
                   2022-08-13 Celta Vigo-Espanyol               2
                   2022-08-13 Real Valladolid-Villarreal        0
                   2022-08-14 Almeria-Real Madrid               1

                                                        away_score status  \
league      season game
ESP-La Liga 2223   2022-08-12 Osasuna-Sevilla                    1     FT
                   2022-08-13 Barcelona-Rayo Vallecano           0     FT
                   2022-08-13 Celta Vigo-Espanyol                2     FT
                   2022-08-13 Real Valladolid-Villarreal         3     FT
                   2022-08-14 Almeria-Real Madrid                2     FT

                                                         game_id  \
league      season game
ESP-La Liga 2223   2022-08-12 Osasuna-Sevilla            3918013
                   2022-08-13 Barcelona-Rayo Vallecano   3918009
                   2022-08-13 Celta Vigo-Espanyol        3918011
                   2022-08-13 Real Valladolid-Villarreal 3918016
                   2022-08-14 Almeria-Real Madrid        3918014


                                                                                 ␣
↪                 url
league      season game
ESP-La Liga 2223   2022-08-12 Osasuna-Sevilla            https://fotmob.com/matches/
↪sevilla-vs-osasuna/...
                   2022-08-13 Barcelona-Rayo Vallecano   https://fotmob.com/matches/
↪rayo-vallecano-vs-b...
                   2022-08-13 Celta Vigo-Espanyol        https://fotmob.com/matches/
↪espanyol-vs-celta-v...
                   2022-08-13 Real Valladolid-Villarreal https://fotmob.com/matches/
↪villarreal-vs-real-...
                   2022-08-14 Almeria-Real Madrid        https://fotmob.com/matches/
↪real-madrid-vs-alme...
```

2.5.3 Read team match stats

[7]:
```
match_stats = fotmob.read_team_match_stats(opponent_stats=False, team='Valencia')
match_stats.head()
```

[7]:
```
                                                                Accurate passes  \
league      season game                                team
ESP-La Liga 2223   2022-08-14 Valencia-Girona          Valencia             285
                   2022-08-21 Athletic Club-Valencia   Valencia             432
                   2022-08-29 Valencia-Atletico Madrid Valencia             513
                   2022-09-04 Valencia-Getafe          Valencia             482
                   2022-09-10 Rayo Vallecano-Valencia  Valencia             266

                                                                Ball possession  \
league      season game                                team
```

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```
ESP-La Liga 2223   2022-08-14 Valencia-Girona          Valencia              46
                   2022-08-21 Athletic Club-Valencia   Valencia              63
                   2022-08-29 Valencia-Atletico Madrid Valencia              70
                   2022-09-04 Valencia-Getafe          Valencia              70
                   2022-09-10 Rayo Vallecano-Valencia  Valencia              54

                                                                  Big chances  \
league      season game                                 team
ESP-La Liga 2223   2022-08-14 Valencia-Girona          Valencia           2
                   2022-08-21 Athletic Club-Valencia   Valencia           1
                   2022-08-29 Valencia-Atletico Madrid Valencia           0
                   2022-09-04 Valencia-Getafe          Valencia           4
                   2022-09-10 Rayo Vallecano-Valencia  Valencia           3

                                                                  Big chances missed  \
league      season game                                 team
ESP-La Liga 2223   2022-08-14 Valencia-Girona          Valencia                 1
                   2022-08-21 Athletic Club-Valencia   Valencia                 1
                   2022-08-29 Valencia-Atletico Madrid Valencia                 0
                   2022-09-04 Valencia-Getafe          Valencia                 1
                   2022-09-10 Rayo Vallecano-Valencia  Valencia                 2

                                                                  Corners  \
league      season game                                 team
ESP-La Liga 2223   2022-08-14 Valencia-Girona          Valencia       4
                   2022-08-21 Athletic Club-Valencia   Valencia       3
                   2022-08-29 Valencia-Atletico Madrid Valencia       6
                   2022-09-04 Valencia-Getafe          Valencia       9
                   2022-09-10 Rayo Vallecano-Valencia  Valencia       7

                                                                  Expected goals (xG)  \
league      season game                                 team
ESP-La Liga 2223   2022-08-14 Valencia-Girona          Valencia               1.62
                   2022-08-21 Athletic Club-Valencia   Valencia               0.73
                   2022-08-29 Valencia-Atletico Madrid Valencia               0.51
                   2022-09-04 Valencia-Getafe          Valencia               2.30
                   2022-09-10 Rayo Vallecano-Valencia  Valencia               1.80

                                                                  Fouls committed  \
league      season game                                 team
ESP-La Liga 2223   2022-08-14 Valencia-Girona          Valencia              18
                   2022-08-21 Athletic Club-Valencia   Valencia              15
                   2022-08-29 Valencia-Atletico Madrid Valencia              15
                   2022-09-04 Valencia-Getafe          Valencia              11
                   2022-09-10 Rayo Vallecano-Valencia  Valencia              11

                                                                  Shots on target  \
league      season game                                 team
ESP-La Liga 2223   2022-08-14 Valencia-Girona          Valencia               2
                   2022-08-21 Athletic Club-Valencia   Valencia               0
                   2022-08-29 Valencia-Atletico Madrid Valencia               2
                   2022-09-04 Valencia-Getafe          Valencia               9
```

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```
                  2022-09-10 Rayo Vallecano-Valencia  Valencia               4

                                                                    Total shots  \
league      season game                                team
ESP-La Liga 2223   2022-08-14 Valencia-Girona          Valencia          17
                   2022-08-21 Athletic Club-Valencia   Valencia          10
                   2022-08-29 Valencia-Atletico Madrid Valencia          12
                   2022-09-04 Valencia-Getafe          Valencia          24
                   2022-09-10 Rayo Vallecano-Valencia  Valencia          17

                                                                  Accurate passes (%)
league      season game                                team
ESP-La Liga 2223   2022-08-14 Valencia-Girona          Valencia                 0.81
                   2022-08-21 Athletic Club-Valencia   Valencia                 0.85
                   2022-08-29 Valencia-Atletico Madrid Valencia                 0.88
                   2022-09-04 Valencia-Getafe          Valencia                 0.88
                   2022-09-10 Rayo Vallecano-Valencia  Valencia                 0.77
```

doc/datasources/FotMob.ipynb ends here.

The following section was generated from doc/datasources/MatchHistory.ipynb

[3]:
```
import soccerdata as sd
```

2.6 Match History

[4]:
```
mh = sd.MatchHistory(leagues="ENG-Premier League", seasons=2021)
print(mh.__doc__)
```

```
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/_common.py:466:␣
↪UserWarning: Season id "2021" is ambiguous: interpreting as "20-21"
  warnings.warn(msg)
```

```
Provides pd.DataFrames from CSV files available at http://www.football-data.co.uk/data.
↪php.

    Data will be downloaded as necessary and cached locally in
    ``~/soccerdata/data/MatchHistory``.

    Parameters
    ----------
    leagues : string or iterable
        IDs of leagues to include.
    seasons : string, int or list
        Seasons to include. Supports multiple formats.
        Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
    proxy : 'tor' or or dict or list(dict) or callable, optional
        Use a proxy to hide your IP address. Valid options are:
            - "tor": Uses the Tor network. Tor should be running in
              the background on port 9050.
            - dict: A dictionary with the proxy to use. The dict should be
```

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```
            a mapping of supported protocols to proxy addresses. For example::

                {
                    'http': 'http://10.10.1.10:3128',
                    'https': 'http://10.10.1.10:1080',
                }

            - list(dict): A list of proxies to choose from. A different proxy will
              be selected from this list after failed requests, allowing rotating
              proxies.
            - callable: A function that returns a valid proxy. This function will
              be called after failed requests, allowing rotating proxies.
    no_cache : bool
        If True, will not use cached data.
    no_store : bool
        If True, will not store downloaded data.
    data_dir : Path, optional
        Path to directory where data will be cached.
```

2.6.1 Historic match results and betting odds

[5]:
```
hist = mh.read_games()
hist.head()
```

[5]:
```
                                                                    date  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton 2020-01-11 12:00:00
                          2020-01-11 Man United-Arsenal      2020-01-11 16:30:00
                          2020-01-11 Newcastle-Everton       2020-01-11 14:00:00
                          2020-01-11 Tottenham-Brighton      2020-01-11 19:15:00
                          2020-02-11 Fulham-West Brom        2020-02-11 17:30:00

                                                               home_team  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  Aston Villa
                          2020-01-11 Man United-Arsenal        Man United
                          2020-01-11 Newcastle-Everton          Newcastle
                          2020-01-11 Tottenham-Brighton         Tottenham
                          2020-02-11 Fulham-West Brom              Fulham

                                                               away_team  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  Southampton
                          2020-01-11 Man United-Arsenal           Arsenal
                          2020-01-11 Newcastle-Everton            Everton
                          2020-01-11 Tottenham-Brighton          Brighton
                          2020-02-11 Fulham-West Brom           West Brom

                                                              FTHG  FTAG FTR  \
league             season game
```

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```
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton     3     4   A
                          2020-01-11 Man United-Arsenal          0     1   A
                          2020-01-11 Newcastle-Everton           2     1   H
                          2020-01-11 Tottenham-Brighton          2     1   H
                          2020-02-11 Fulham-West Brom            2     0   H

                                                                HTHG  HTAG HTR  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton     0     3   A
                          2020-01-11 Man United-Arsenal          0     0   D
                          2020-01-11 Newcastle-Everton           0     0   D
                          2020-01-11 Tottenham-Brighton          1     0   H
                          2020-02-11 Fulham-West Brom            2     0   H

                                                                  referee  HS  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  D England  19
                          2020-01-11 Man United-Arsenal         M Dean   8
                          2020-01-11 Newcastle-Everton        S Attwell  11
                          2020-01-11 Tottenham-Brighton         G Scott   9
                          2020-02-11 Fulham-West Brom          S Hooper  13

                                                                AS  HST  AST  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton   9   10    4
                          2020-01-11 Man United-Arsenal        7    2    2
                          2020-01-11 Newcastle-Everton        15    4    4
                          2020-01-11 Tottenham-Brighton        6    3    2
                          2020-02-11 Fulham-West Brom         10    6    1

                                                                HF  AF  HC  AC  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  12  17  11   1
                          2020-01-11 Man United-Arsenal       12  12   6   3
                          2020-01-11 Newcastle-Everton         9  10   5   4
                          2020-01-11 Tottenham-Brighton       14  13   4   5
                          2020-02-11 Fulham-West Brom         13  11   5   2

                                                                HY  AY  HR  AR  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton   1   2   0   0
                          2020-01-11 Man United-Arsenal        3   3   0   0
                          2020-01-11 Newcastle-Everton         2   4   0   0
                          2020-01-11 Tottenham-Brighton        2   1   0   0
                          2020-02-11 Fulham-West Brom          3   2   0   0

                                                              B365H  B365D  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton   2.45    3.5
                          2020-01-11 Man United-Arsenal        2.00    3.6
                          2020-01-11 Newcastle-Everton         3.70    3.4
                          2020-01-11 Tottenham-Brighton        1.61    4.0
```

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```
                        2020-02-11 Fulham-West Brom          2.40    3.3

                                                            B365A   BWH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton   2.80  2.35
                          2020-01-11 Man United-Arsenal        3.60  2.00
                          2020-01-11 Newcastle-Everton         2.05  3.75
                          2020-01-11 Tottenham-Brighton        5.50  1.62
                          2020-02-11 Fulham-West Brom          3.00  2.40

                                                             BWD   BWA  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  3.60  2.85
                          2020-01-11 Man United-Arsenal       3.70  3.60
                          2020-01-11 Newcastle-Everton        3.40  2.05
                          2020-01-11 Tottenham-Brighton       4.25  5.00
                          2020-02-11 Fulham-West Brom         3.30  3.00

                                                             IWH   IWD  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.50  3.35
                          2020-01-11 Man United-Arsenal       2.05  3.45
                          2020-01-11 Newcastle-Everton        3.55  3.30
                          2020-01-11 Tottenham-Brighton       1.65  3.90
                          2020-02-11 Fulham-West Brom         2.45  3.10

                                                             IWA   PSH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.75  2.53
                          2020-01-11 Man United-Arsenal       3.55  2.05
                          2020-01-11 Newcastle-Everton        2.10  3.82
                          2020-01-11 Tottenham-Brighton       5.00  1.65
                          2020-02-11 Fulham-West Brom         3.00  2.47

                                                             PSD   PSA  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  3.72  2.81
                          2020-01-11 Man United-Arsenal       3.78  3.73
                          2020-01-11 Newcastle-Everton        3.56  2.09
                          2020-01-11 Tottenham-Brighton       4.26  5.54
                          2020-02-11 Fulham-West Brom         3.40  3.13

                                                             WHH  WHD   WHA  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.50  3.5  2.75
                          2020-01-11 Man United-Arsenal       2.05  3.6  3.60
                          2020-01-11 Newcastle-Everton        3.70  3.4  2.05
                          2020-01-11 Tottenham-Brighton       1.63  4.0  5.25
                          2020-02-11 Fulham-West Brom         2.40  3.3  3.00

                                                             VCH   VCD  \
league             season game
```

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```
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.40  3.60
                          2020-01-11 Man United-Arsenal       2.05  3.60
                          2020-01-11 Newcastle-Everton        3.50  3.50
                          2020-01-11 Tottenham-Brighton       1.62  4.20
                          2020-02-11 Fulham-West Brom         2.45  3.25

                                                               VCA  MaxH  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.80  2.60
                          2020-01-11 Man United-Arsenal       3.50  2.10
                          2020-01-11 Newcastle-Everton        2.05  4.00
                          2020-01-11 Tottenham-Brighton       5.25  1.67
                          2020-02-11 Fulham-West Brom         3.00  2.56

                                                              MaxD  MaxA  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  3.84  2.85
                          2020-01-11 Man United-Arsenal       3.85  3.76
                          2020-01-11 Newcastle-Everton        3.59  2.15
                          2020-01-11 Tottenham-Brighton       4.30  5.75
                          2020-02-11 Fulham-West Brom         3.50  3.17

                                                              AvgH  AvgD  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.46  3.60
                          2020-01-11 Man United-Arsenal       2.04  3.66
                          2020-01-11 Newcastle-Everton        3.71  3.47
                          2020-01-11 Tottenham-Brighton       1.63  4.17
                          2020-02-11 Fulham-West Brom         2.44  3.32

                                                              AvgA  B365>2.5  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.78      1.66
                          2020-01-11 Man United-Arsenal       3.58      1.72
                          2020-01-11 Newcastle-Everton        2.06      1.80
                          2020-01-11 Tottenham-Brighton       5.29      1.66
                          2020-02-11 Fulham-West Brom         3.01      2.00

                                                              B365<2.5  P>2.5  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton      2.2   1.66
                          2020-01-11 Man United-Arsenal           2.1   1.76
                          2020-01-11 Newcastle-Everton            2.0   1.86
                          2020-01-11 Tottenham-Brighton           2.2   1.68
                          2020-02-11 Fulham-West Brom             1.8   2.13

                                                              P<2.5  Max>2.5  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton   2.37     1.69
                          2020-01-11 Man United-Arsenal        2.19     1.81
                          2020-01-11 Newcastle-Everton         2.07     1.88
                          2020-01-11 Tottenham-Brighton        2.32     1.71
```

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```
                        2020-02-11 Fulham-West Brom          1.80     2.14

                                                            Max<2.5  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton    2.38
                          2020-01-11 Man United-Arsenal         2.22
                          2020-01-11 Newcastle-Everton          2.08
                          2020-01-11 Tottenham-Brighton         2.35
                          2020-02-11 Fulham-West Brom           1.85

                                                            Avg>2.5  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton    1.65
                          2020-01-11 Man United-Arsenal         1.74
                          2020-01-11 Newcastle-Everton          1.82
                          2020-01-11 Tottenham-Brighton         1.65
                          2020-02-11 Fulham-West Brom           2.06

                                                            Avg<2.5   AHh  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton    2.27  0.00
                          2020-01-11 Man United-Arsenal         2.12 -0.50
                          2020-01-11 Newcastle-Everton          2.01  0.25
                          2020-01-11 Tottenham-Brighton         2.26 -1.00
                          2020-02-11 Fulham-West Brom           1.78 -0.25

                                                            B365AHH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton    1.83
                          2020-01-11 Man United-Arsenal         2.05
                          2020-01-11 Newcastle-Everton          2.05
                          2020-01-11 Tottenham-Brighton         2.02
                          2020-02-11 Fulham-West Brom           2.10

                                                            B365AHA  PAHH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton    2.07  1.87
                          2020-01-11 Man United-Arsenal         1.85  2.05
                          2020-01-11 Newcastle-Everton          1.75  2.15
                          2020-01-11 Tottenham-Brighton         1.77  2.15
                          2020-02-11 Fulham-West Brom           1.80  2.11

                                                            PAHA  MaxAHH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.07    1.87
                          2020-01-11 Man United-Arsenal       1.88    2.09
                          2020-01-11 Newcastle-Everton        1.80    2.17
                          2020-01-11 Tottenham-Brighton       1.80    2.16
                          2020-02-11 Fulham-West Brom         1.84    2.15

                                                            MaxAHA  AvgAHH  \
league             season game
```

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```
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton    2.09    1.83
                          2020-01-11 Man United-Arsenal         1.90    2.04
                          2020-01-11 Newcastle-Everton          1.83    2.12
                          2020-01-11 Tottenham-Brighton         1.84    2.09
                          2020-02-11 Fulham-West Brom           1.86    2.10

                                                               AvgAHA  B365CH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton    2.05    2.60
                          2020-01-11 Man United-Arsenal         1.84    1.95
                          2020-01-11 Newcastle-Everton          1.77    3.30
                          2020-01-11 Tottenham-Brighton         1.80    1.55
                          2020-02-11 Fulham-West Brom           1.80    2.40

                                                               B365CD  B365CA  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton    3.50    2.62
                          2020-01-11 Man United-Arsenal         3.60    3.80
                          2020-01-11 Newcastle-Everton          3.30    2.25
                          2020-01-11 Tottenham-Brighton         4.33    6.00
                          2020-02-11 Fulham-West Brom           3.30    3.00

                                                               BWCH  BWCD  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.50  3.60
                          2020-01-11 Man United-Arsenal       1.95  3.60
                          2020-01-11 Newcastle-Everton        3.30  3.30
                          2020-01-11 Tottenham-Brighton       1.57  4.25
                          2020-02-11 Fulham-West Brom         2.45  3.30

                                                               BWCA  IWCH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.70  2.55
                          2020-01-11 Man United-Arsenal       3.90  2.00
                          2020-01-11 Newcastle-Everton        2.25  3.15
                          2020-01-11 Tottenham-Brighton       5.50  1.60
                          2020-02-11 Fulham-West Brom         2.95  2.40

                                                               IWCD  IWCA  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  3.50  2.70
                          2020-01-11 Man United-Arsenal       3.50  3.80
                          2020-01-11 Newcastle-Everton        3.35  2.30
                          2020-01-11 Tottenham-Brighton       4.20  5.75
                          2020-02-11 Fulham-West Brom         3.05  3.10

                                                               PSCH  PSCD  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.69  3.56
                          2020-01-11 Man United-Arsenal       2.02  3.65
                          2020-01-11 Newcastle-Everton        3.34  3.43
                          2020-01-11 Tottenham-Brighton       1.61  4.36
```

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```
                        2020-02-11 Fulham-West Brom         2.48  3.32

                                                            PSCA  WHCH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.73  2.60
                          2020-01-11 Man United-Arsenal       3.97  2.00
                          2020-01-11 Newcastle-Everton        2.33  3.40
                          2020-01-11 Tottenham-Brighton       5.77  1.57
                          2020-02-11 Fulham-West Brom         3.19  2.40

                                                            WHCD  WHCA  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  3.50  2.62
                          2020-01-11 Man United-Arsenal       3.50  3.80
                          2020-01-11 Newcastle-Everton        3.25  2.25
                          2020-01-11 Tottenham-Brighton       4.00  6.00
                          2020-02-11 Fulham-West Brom         3.20  3.10

                                                            VCCH  VCCD  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.50  3.60
                          2020-01-11 Man United-Arsenal       1.95  3.50
                          2020-01-11 Newcastle-Everton        3.30  3.30
                          2020-01-11 Tottenham-Brighton       1.57  4.20
                          2020-02-11 Fulham-West Brom         2.40  3.25

                                                            VCCA  MaxCH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton  2.70   2.70
                          2020-01-11 Man United-Arsenal       4.00   2.06
                          2020-01-11 Newcastle-Everton        2.25   3.62
                          2020-01-11 Tottenham-Brighton       5.75   1.63
                          2020-02-11 Fulham-West Brom         3.10   2.48

                                                            MaxCD  MaxCA  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton   3.70   2.80
                          2020-01-11 Man United-Arsenal        3.75   4.00
                          2020-01-11 Newcastle-Everton         3.50   2.34
                          2020-01-11 Tottenham-Brighton        4.45   6.39
                          2020-02-11 Fulham-West Brom          3.45   3.22

                                                            AvgCH  AvgCD  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton   2.57   3.55
                          2020-01-11 Man United-Arsenal        1.99   3.59
                          2020-01-11 Newcastle-Everton         3.34   3.33
                          2020-01-11 Tottenham-Brighton        1.59   4.29
                          2020-02-11 Fulham-West Brom          2.41   3.27

                                                            AvgCA  \
league             season game
```

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```
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton   2.69
                          2020-01-11 Man United-Arsenal        3.87
                          2020-01-11 Newcastle-Everton         2.27
                          2020-01-11 Tottenham-Brighton        5.62
                          2020-02-11 Fulham-West Brom          3.09

                                                              B365C>2.5  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton       1.66
                          2020-01-11 Man United-Arsenal            1.90
                          2020-01-11 Newcastle-Everton             2.00
                          2020-01-11 Tottenham-Brighton            1.66
                          2020-02-11 Fulham-West Brom              2.05

                                                              B365C<2.5  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton       2.20
                          2020-01-11 Man United-Arsenal            1.90
                          2020-01-11 Newcastle-Everton             1.80
                          2020-01-11 Tottenham-Brighton            2.20
                          2020-02-11 Fulham-West Brom              1.85

                                                              PC>2.5  PC<2.5  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton    1.70    2.29
                          2020-01-11 Man United-Arsenal         1.96    1.96
                          2020-01-11 Newcastle-Everton          2.12    1.81
                          2020-01-11 Tottenham-Brighton         1.68    2.32
                          2020-02-11 Fulham-West Brom           2.05    1.88

                                                              MaxC>2.5  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton      1.71
                          2020-01-11 Man United-Arsenal           1.99
                          2020-01-11 Newcastle-Everton            2.14
                          2020-01-11 Tottenham-Brighton           1.72
                          2020-02-11 Fulham-West Brom             2.11

                                                              MaxC<2.5  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton      2.37
                          2020-01-11 Man United-Arsenal           2.10
                          2020-01-11 Newcastle-Everton            1.92
                          2020-01-11 Tottenham-Brighton           2.37
                          2020-02-11 Fulham-West Brom             1.92

                                                              AvgC>2.5  \
league              season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton      1.66
                          2020-01-11 Man United-Arsenal           1.88
                          2020-01-11 Newcastle-Everton            2.04
                          2020-01-11 Tottenham-Brighton           1.65
```

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```
                        2020-02-11 Fulham-West Brom            2.02

                                                              AvgC<2.5  AHCh  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton     2.24  0.00
                          2020-01-11 Man United-Arsenal          1.95 -0.50
                          2020-01-11 Newcastle-Everton           1.80  0.25
                          2020-01-11 Tottenham-Brighton          2.27 -1.00
                          2020-02-11 Fulham-West Brom            1.81 -0.25

                                                              B365CAHH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton     1.93
                          2020-01-11 Man United-Arsenal          2.00
                          2020-01-11 Newcastle-Everton           1.95
                          2020-01-11 Tottenham-Brighton          2.06
                          2020-02-11 Fulham-West Brom            2.06

                                                              B365CAHA  PCAHH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton     1.97   1.95
                          2020-01-11 Man United-Arsenal          1.90   2.03
                          2020-01-11 Newcastle-Everton           1.95   1.93
                          2020-01-11 Tottenham-Brighton          1.84   2.11
                          2020-02-11 Fulham-West Brom            1.84   2.11

                                                              PCAHA  MaxCAHH  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton   1.98     1.97
                          2020-01-11 Man United-Arsenal        1.90     2.05
                          2020-01-11 Newcastle-Everton         2.00     1.99
                          2020-01-11 Tottenham-Brighton        1.84     2.13
                          2020-02-11 Fulham-West Brom          1.84     2.12

                                                              MaxCAHA  \
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton    2.04
                          2020-01-11 Man United-Arsenal         1.92
                          2020-01-11 Newcastle-Everton          2.03
                          2020-01-11 Tottenham-Brighton         1.99
                          2020-02-11 Fulham-West Brom           1.87

                                                              AvgCAHH  AvgCAHA
league             season game
ENG-Premier League 2021   2020-01-11 Aston Villa-Southampton    1.89     1.98
                          2020-01-11 Man United-Arsenal         2.00     1.88
                          2020-01-11 Newcastle-Everton          1.93     1.95
                          2020-01-11 Tottenham-Brighton         2.02     1.86
                          2020-02-11 Fulham-West Brom           2.08     1.82
```

doc/datasources/MatchHistory.ipynb ends here.

The following section was generated from doc/datasources/SoFIFA.ipynb

[3]:
```
import soccerdata as sd
```

2.7 SoFIFA

[4]:
```
sofifa = sd.SoFIFA(leagues="ENG-Premier League", versions="latest")
print(sofifa.__doc__)
```

```
Provides pd.DataFrames from data at http://sofifa.com.

    Data will be downloaded as necessary and cached locally in
    ``~/soccerdata/data/SoFIFA``.

    Parameters
    ----------
    leagues : string or iterable, optional
        IDs of leagues to include.
    versions : string, int or list of int, optional
        FIFA releases to include. Should be specified by their ID used in the URL
        (e.g., 230034). Alternatively, the string "all" can be used to include all
        versions and "latest" to include the latest version only. Defaults to
        "latest".
    proxy : 'tor' or dict or list(dict) or callable, optional
        Use a proxy to hide your IP address. Valid options are:
            - "tor": Uses the Tor network. Tor should be running in
              the background on port 9050.
            - dict: A dictionary with the proxy to use. The dict should be
              a mapping of supported protocols to proxy addresses. For example::

                  {
                      'http': 'http://10.10.1.10:3128',
                      'https': 'http://10.10.1.10:1080',
                  }

            - list(dict): A list of proxies to choose from. A different proxy will
              be selected from this list after failed requests, allowing rotating
              proxies.
            - callable: A function that returns a valid proxy. This function will
              be called after failed requests, allowing rotating proxies.
    no_cache : bool
        If True, will not use cached data.
    no_store : bool
        If True, will not store downloaded data.
    data_dir : Path
        Path to directory where data will be cached.
```

2.7.1 EA Sports FIFA team ratings

[5]:
```
team_ratings = sofifa.read_team_ratings()
team_ratings.head()
```

[5]:
```
                                        overall attack midfield defence  \
league             team
ENG-Premier League AFC Bournemouth           74     75       73      73
                   Arsenal                   82     82       84      81
                   Aston Villa               79     79       77      79
                   Brentford                 75     74       75      76
                   Brighton & Hove Albion    77     75       77      78

                                        transfer_budget players  \
league             team
ENG-Premier League AFC Bournemouth                  €0      29
                   Arsenal                          €0      32
                   Aston Villa                      €0      32
                   Brentford                        €0      31
                   Brighton & Hove Albion           €0      28

                                        fifa_edition        update
league             team
ENG-Premier League AFC Bournemouth           FIFA 23  May 26, 2023
                   Arsenal                   FIFA 23  May 26, 2023
                   Aston Villa               FIFA 23  May 26, 2023
                   Brentford                 FIFA 23  May 26, 2023
                   Brighton & Hove Albion    FIFA 23  May 26, 2023
```

2.7.2 EA Sports FIFA player ratings

[6]:
```
player_ratings = sofifa.read_player_ratings(team="Arsenal")
player_ratings.head()
```

[6]:
```
                          fifa_edition        update overallrating potential  \
player
Aaron Ramsdale                 FIFA 23  May 26, 2023            83        86
Ainsley Maitland-Niles         FIFA 23  May 26, 2023            73        75
Albert-Mboyo Sambi Lokonga     FIFA 23  May 26, 2023            75        82
Amario Cozier-Duberry          FIFA 23  May 26, 2023            59        77
Arthur Okonkwo                 FIFA 23  May 26, 2023            66        75

                          crossing finishing headingaccuracy shortpassing  \
player
Aaron Ramsdale                  15        14              15           56
Ainsley Maitland-Niles          67        58              54           74
Albert-Mboyo Sambi Lokonga      68        53              61           79
Amario Cozier-Duberry           58        57              38           55
Arthur Okonkwo                  10         6              12           33

                          volleys dribbling curve fk_accuracy longpassing  \
player
```

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```
Aaron Ramsdale                  16        18    17          16          57
Ainsley Maitland-Niles          44        71    64          50          66
Albert-Mboyo Sambi Lokonga      58        78    71          68          77
Amario Cozier-Duberry           60        60    53          41          44
Arthur Okonkwo                   7         9    12          20          20

                          ballcontrol acceleration sprintspeed agility  \
player
Aaron Ramsdale                     36           47          50      53
Ainsley Maitland-Niles             73           79          77      79
Albert-Mboyo Sambi Lokonga         81           63          69      78
Amario Cozier-Duberry              58           72          69      73
Arthur Okonkwo                     17           44          44      40

                          reactions balance shotpower jumping stamina  \
player
Aaron Ramsdale                   82      49        65      66      35
Ainsley Maitland-Niles           70      69        67      66      69
Albert-Mboyo Sambi Lokonga       72      68        68      71      77
Amario Cozier-Duberry            50      68        56      44      55
Arthur Okonkwo                   63      31        47      50      29

                          strength longshots aggression interceptions  \
player
Aaron Ramsdale                  59        15         35            24
Ainsley Maitland-Niles          67        62         65            70
Albert-Mboyo Sambi Lokonga      63        63         72            77
Amario Cozier-Duberry           45        45         55            27
Arthur Okonkwo                  50         7         20            11

                          positioning vision penalties composure  \
player
Aaron Ramsdale                   18     65        25        65
Ainsley Maitland-Niles           69     67        69        70
Albert-Mboyo Sambi Lokonga       65     75        41        80
Amario Cozier-Duberry            59     56        55        55
Arthur Okonkwo                    6     35        19        30

                          defensiveawareness standingtackle slidingtackle  \
player
Aaron Ramsdale                        20             16            15
Ainsley Maitland-Niles                66             74            72
Albert-Mboyo Sambi Lokonga            64             73            68
Amario Cozier-Duberry                 28             28            24
Arthur Okonkwo                        13             13            12

                          gk_diving gk_handling gk_kicking gk_positioning  \
player
Aaron Ramsdale                  84          79         87             79
Ainsley Maitland-Niles          15           9          7             10
Albert-Mboyo Sambi Lokonga      14           7          6             13
Amario Cozier-Duberry           11          12          9             13
```

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```
Arthur Okonkwo                    64          65         63             67

                           gk_reflexes
player
Aaron Ramsdale                      86
Ainsley Maitland-Niles              13
Albert-Mboyo Sambi Lokonga           9
Amario Cozier-Duberry                7
Arthur Okonkwo                      66
```

[7]:
```
sofifa.read_teams()
```

[7]:
```
                           team              league fifa_edition  \
team_id
10                Manchester City  ENG-Premier League      FIFA 23
9                       Liverpool  ENG-Premier League      FIFA 23
1                         Arsenal  ENG-Premier League      FIFA 23
5                         Chelsea  ENG-Premier League      FIFA 23
11              Manchester United  ENG-Premier League      FIFA 23
18              Tottenham Hotspur  ENG-Premier League      FIFA 23
13               Newcastle United  ENG-Premier League      FIFA 23
2                     Aston Villa  ENG-Premier League      FIFA 23
19                West Ham United  ENG-Premier League      FIFA 23
95                 Leicester City  ENG-Premier League      FIFA 23
110      Wolverhampton Wanderers  ENG-Premier League      FIFA 23
14             Nottingham Forest  ENG-Premier League      FIFA 23
1808      Brighton & Hove Albion  ENG-Premier League      FIFA 23
7                        Everton  ENG-Premier League      FIFA 23
1799               Crystal Palace  ENG-Premier League      FIFA 23
144                        Fulham  ENG-Premier League      FIFA 23
8                    Leeds United  ENG-Premier League      FIFA 23
17                    Southampton  ENG-Premier League      FIFA 23
1925                    Brentford  ENG-Premier League      FIFA 23
1943              AFC Bournemouth  ENG-Premier League      FIFA 23

                update
team_id
10       May 26, 2023
9        May 26, 2023
1        May 26, 2023
5        May 26, 2023
11       May 26, 2023
18       May 26, 2023
13       May 26, 2023
2        May 26, 2023
19       May 26, 2023
95       May 26, 2023
110      May 26, 2023
14       May 26, 2023
1808     May 26, 2023
7        May 26, 2023
1799     May 26, 2023
```

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```
144     May 26, 2023
8       May 26, 2023
17      May 26, 2023
1925    May 26, 2023
1943    May 26, 2023
```

[8]:
```
sofifa.read_players(team="Arsenal")
```

[8]:
```
                                  player     team              league  \
player_id
233934                     Aaron Ramsdale  Arsenal  ENG-Premier League
231936                     Benjamin White  Arsenal  ENG-Premier League
243715                     William Saliba  Arsenal  ENG-Premier League
232580           Gabriel dos S. Magalhães  Arsenal  ENG-Premier League
227813                Oleksandr Zinchenko  Arsenal  ENG-Premier League
205498            Luiz Frello Filho Jorge  Arsenal  ENG-Premier League
222665                   Martin Ødegaard  Arsenal  ENG-Premier League
199503                      Granit Xhaka  Arsenal  ENG-Premier League
246669                       Bukayo Saka  Arsenal  ENG-Premier League
230666           Gabriel Fernando de Jesus  Arsenal  ENG-Premier League
251566    Gabriel Teodoro Martinelli Silva  Arsenal  ENG-Premier League
207421                   Leandro Trossard  Arsenal  ENG-Premier League
236988                      Eddie Nketiah  Arsenal  ENG-Premier League
209989                      Thomas Partey  Arsenal  ENG-Premier League
256958       Fábio Daniel Ferreira Vieira  Arsenal  ENG-Premier League
226491                     Kieran Tierney  Arsenal  ENG-Premier League
265693                       Jakub Kiwior  Arsenal  ENG-Premier League
233267                       Matt Turner  Arsenal  ENG-Premier League
228295                       Rob Holding  Arsenal  ENG-Premier League
240273                  Emile Smith Rowe  Arsenal  ENG-Premier League
231448                      Reiss Nelson  Arsenal  ENG-Premier League
211454                     Mohamed Elneny  Arsenal  ENG-Premier League
232938                  Takehiro Tomiyasu  Arsenal  ENG-Premier League
247731                      Matthew Smith  Arsenal  ENG-Premier League
248732                          Karl Hein  Arsenal  ENG-Premier League
259403                       Joel Ideho  Arsenal  ENG-Premier League
260141                  Cătălin C^ırjan  Arsenal  ENG-Premier League
259095                      George Lewis  Arsenal  ENG-Premier League
271743              Amario Cozier-Duberry  Arsenal  ENG-Premier League
271808                          Lino Sousa  Arsenal  ENG-Premier League
259097          Salah-Eddine Oulad M'Hand  Arsenal  ENG-Premier League
274387                     Reuell Walters  Arsenal  ENG-Premier League
270390     Marcus Vincius Oliveira Alencar  Arsenal  ENG-Premier League
260653                Brooke Norton-Cuffy  Arsenal  ENG-Premier League
260144                     Charlie Patino  Arsenal  ENG-Premier League
251530       Nuno Albertino Varela Tavares  Arsenal  ENG-Premier League
247463                   Folarin Balogun  Arsenal  ENG-Premier League
246671                     Arthur Okonkwo  Arsenal  ENG-Premier League
241928                Albert Sambi Lokonga  Arsenal  ENG-Premier League
235755                      Auston Trusty  Arsenal  ENG-Premier League
226110                       Nicolas Pépé  Arsenal  ENG-Premier League
225782              Ainsley Maitland-Niles  Arsenal  ENG-Premier League
```

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```
222562                 Rúnar Alex Rúnarsson  Arsenal  ENG-Premier League
206654                    Pablo Marí Villar  Arsenal  ENG-Premier League
201118          Cédric Ricardo Alves Soares  Arsenal  ENG-Premier League

          fifa_edition        update
player_id
233934         FIFA 23  May 26, 2023
231936         FIFA 23  May 26, 2023
243715         FIFA 23  May 26, 2023
232580         FIFA 23  May 26, 2023
227813         FIFA 23  May 26, 2023
205498         FIFA 23  May 26, 2023
222665         FIFA 23  May 26, 2023
199503         FIFA 23  May 26, 2023
246669         FIFA 23  May 26, 2023
230666         FIFA 23  May 26, 2023
251566         FIFA 23  May 26, 2023
207421         FIFA 23  May 26, 2023
236988         FIFA 23  May 26, 2023
209989         FIFA 23  May 26, 2023
256958         FIFA 23  May 26, 2023
226491         FIFA 23  May 26, 2023
265693         FIFA 23  May 26, 2023
233267         FIFA 23  May 26, 2023
228295         FIFA 23  May 26, 2023
240273         FIFA 23  May 26, 2023
231448         FIFA 23  May 26, 2023
211454         FIFA 23  May 26, 2023
232938         FIFA 23  May 26, 2023
247731         FIFA 23  May 26, 2023
248732         FIFA 23  May 26, 2023
259403         FIFA 23  May 26, 2023
260141         FIFA 23  May 26, 2023
259095         FIFA 23  May 26, 2023
271743         FIFA 23  May 26, 2023
271808         FIFA 23  May 26, 2023
259097         FIFA 23  May 26, 2023
274387         FIFA 23  May 26, 2023
270390         FIFA 23  May 26, 2023
260653         FIFA 23  May 26, 2023
260144         FIFA 23  May 26, 2023
251530         FIFA 23  May 26, 2023
247463         FIFA 23  May 26, 2023
246671         FIFA 23  May 26, 2023
241928         FIFA 23  May 26, 2023
235755         FIFA 23  May 26, 2023
226110         FIFA 23  May 26, 2023
225782         FIFA 23  May 26, 2023
222562         FIFA 23  May 26, 2023
206654         FIFA 23  May 26, 2023
201118         FIFA 23  May 26, 2023
```

doc/datasources/SoFIFA.ipynb ends here.

The following section was generated from doc/datasources/Understat.ipynb

[2]:
```
import soccerdata as sd
```

2.8 Understat

[3]:
```
understat = sd.Understat(leagues="ENG-Premier League", seasons="2015/2016")
print(understat.__doc__)
```

```
Provides pd.DataFrames from data at https://understat.com.

    Data will be downloaded as necessary and cached locally in
    ``~/soccerdata/data/Understat``.

    Parameters
    ----------
    proxy : 'tor' or dict or list(dict) or callable, optional
        Use a proxy to hide your IP address. Valid options are:
            - "tor": Uses the Tor network. Tor should be running in
              the background on port 9050.
            - dict: A dictionary with the proxy to use. The dict should be
              a mapping of supported protocols to proxy addresses. For example::

                  {
                      'http': 'http://10.10.1.10:3128',
                      'https': 'http://10.10.1.10:1080',
                  }

            - list(dict): A list of proxies to choose from. A different proxy will
              be selected from this list after failed requests, allowing rotating
              proxies.
            - callable: A function that returns a valid proxy. This function will
              be called after failed requests, allowing rotating proxies.
    no_cache : bool
        If True, will not use cached data.
    no_store : bool
        If True, will not store downloaded data.
    data_dir : Path
        Path to directory where data will be cached.
```

2.8.1 Leagues

[4]:
```
leagues = understat.read_leagues()
leagues.head()
```

[4]:

	league_id	url
league		
ENG-Premier League	1	https://understat.com/league/EPL

2.8.2 Seasons

[5]:
```
seasons = understat.read_seasons()
seasons.head()
```

[5]:
```
                         league_id  season_id  \
league             season
ENG-Premier League 1516           1       2015

                                                                url
league             season
ENG-Premier League 1516    https://understat.com/league/EPL/2015
```

2.8.3 Schedule

[6]:
```
schedule = understat.read_schedule()
schedule.head()
```

[6]:
```
                                                          league_id  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa             1
                          2015-08-08 Chelsea-Swansea                    1
                          2015-08-08 Everton-Watford                    1
                          2015-08-08 Leicester-Sunderland               1
                          2015-08-08 Manchester United-Tottenham        1

                                                           season_id  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa          2015
                          2015-08-08 Chelsea-Swansea                  2015
                          2015-08-08 Everton-Watford                  2015
                          2015-08-08 Leicester-Sunderland             2015
                          2015-08-08 Manchester United-Tottenham      2015

                                                           game_id  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa          82
                          2015-08-08 Chelsea-Swansea                  86
                          2015-08-08 Everton-Watford                  83
                          2015-08-08 Leicester-Sunderland             84
                          2015-08-08 Manchester United-Tottenham      81

                                                                        date  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa    2015-08-08 18:00:00
                          2015-08-08 Chelsea-Swansea            2015-08-08 20:30:00
                          2015-08-08 Everton-Watford            2015-08-08 18:00:00
                          2015-08-08 Leicester-Sunderland       2015-08-08 18:00:00
                          2015-08-08 Manchester United-Tottenham 2015-08-08 15:45:00

                                                           home_team_id  \
league             season game
```

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```
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa                73
                          2015-08-08 Chelsea-Swansea                       80
                          2015-08-08 Everton-Watford                       72
                          2015-08-08 Leicester-Sunderland                  75
                          2015-08-08 Manchester United-Tottenham           89

                                                                  away_team_id  \
league              season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa                71
                          2015-08-08 Chelsea-Swansea                       84
                          2015-08-08 Everton-Watford                       90
                          2015-08-08 Leicester-Sunderland                  77
                          2015-08-08 Manchester United-Tottenham           82

                                                                    home_team  \
league              season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa          Bournemouth
                          2015-08-08 Chelsea-Swansea                     Chelsea
                          2015-08-08 Everton-Watford                     Everton
                          2015-08-08 Leicester-Sunderland              Leicester
                          2015-08-08 Manchester United-Tottenham  Manchester United

                                                                    away_team  \
league              season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa      Aston Villa
                          2015-08-08 Chelsea-Swansea                  Swansea
                          2015-08-08 Everton-Watford                  Watford
                          2015-08-08 Leicester-Sunderland           Sunderland
                          2015-08-08 Manchester United-Tottenham    Tottenham

                                                                 away_team_code  \
league              season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa                AVL
                          2015-08-08 Chelsea-Swansea                       SWA
                          2015-08-08 Everton-Watford                       WAT
                          2015-08-08 Leicester-Sunderland                  SUN
                          2015-08-08 Manchester United-Tottenham           TOT

                                                                 home_team_code  \
league              season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa                BOU
                          2015-08-08 Chelsea-Swansea                       CHE
                          2015-08-08 Everton-Watford                       EVE
                          2015-08-08 Leicester-Sunderland                  LEI
                          2015-08-08 Manchester United-Tottenham           MUN

                                                                  home_goals  \
league              season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa                 0
                          2015-08-08 Chelsea-Swansea                        2
                          2015-08-08 Everton-Watford                        2
                          2015-08-08 Leicester-Sunderland                   4
```

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```
                        2015-08-08 Manchester United-Tottenham           1

                                                                  away_goals  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa             1
                          2015-08-08 Chelsea-Swansea                     2
                          2015-08-08 Everton-Watford                     2
                          2015-08-08 Leicester-Sunderland                2
                          2015-08-08 Manchester United-Tottenham         0

                                                                   home_xg  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa      0.876106
                          2015-08-08 Chelsea-Swansea               0.64396
                          2015-08-08 Everton-Watford              0.604226
                          2015-08-08 Leicester-Sunderland          2.56803
                          2015-08-08 Manchester United-Tottenham  0.627539

                                                                   away_xg  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa      0.782253
                          2015-08-08 Chelsea-Swansea               2.59203
                          2015-08-08 Everton-Watford              0.557892
                          2015-08-08 Leicester-Sunderland          1.45946
                          2015-08-08 Manchester United-Tottenham    0.6746

                                                                  is_result  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa          True
                          2015-08-08 Chelsea-Swansea                  True
                          2015-08-08 Everton-Watford                  True
                          2015-08-08 Leicester-Sunderland             True
                          2015-08-08 Manchester United-Tottenham      True

                                                                  has_data  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa         True
                          2015-08-08 Chelsea-Swansea                 True
                          2015-08-08 Everton-Watford                 True
                          2015-08-08 Leicester-Sunderland            True
                          2015-08-08 Manchester United-Tottenham     True

                                                                        ␣
↪    url
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa      https://understat.com/
↪match/82
                          2015-08-08 Chelsea-Swansea              https://understat.com/
↪match/86
                          2015-08-08 Everton-Watford              https://understat.com/
↪match/83
                          2015-08-08 Leicester-Sunderland         https://understat.com/
```

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```
↪match/84
                        2015-08-08 Manchester United-Tottenham  https://understat.com/
↪match/81
```

2.8.4 Team match stats

[7]:
```
team_match_stats = understat.read_team_match_stats()
team_match_stats.head()
```

[7]:
```
                                                          league_id  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa            1
                          2015-08-08 Chelsea-Swansea                   1
                          2015-08-08 Everton-Watford                   1
                          2015-08-08 Leicester-Sunderland              1
                          2015-08-08 Manchester United-Tottenham       1

                                                           season_id  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa         2015
                          2015-08-08 Chelsea-Swansea                 2015
                          2015-08-08 Everton-Watford                 2015
                          2015-08-08 Leicester-Sunderland            2015
                          2015-08-08 Manchester United-Tottenham     2015

                                                           game_id  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa         82
                          2015-08-08 Chelsea-Swansea                 86
                          2015-08-08 Everton-Watford                 83
                          2015-08-08 Leicester-Sunderland            84
                          2015-08-08 Manchester United-Tottenham     81

                                                                        date  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa     2015-08-08 18:00:00
                          2015-08-08 Chelsea-Swansea             2015-08-08 20:30:00
                          2015-08-08 Everton-Watford             2015-08-08 18:00:00
                          2015-08-08 Leicester-Sunderland        2015-08-08 18:00:00
                          2015-08-08 Manchester United-Tottenham 2015-08-08 15:45:00

                                                           home_team_id  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa           73
                          2015-08-08 Chelsea-Swansea                   80
                          2015-08-08 Everton-Watford                   72
                          2015-08-08 Leicester-Sunderland              75
                          2015-08-08 Manchester United-Tottenham       89

                                                           away_team_id  \
league             season game
```

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```
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa               71
                          2015-08-08 Chelsea-Swansea                      84
                          2015-08-08 Everton-Watford                      90
                          2015-08-08 Leicester-Sunderland                 77
                          2015-08-08 Manchester United-Tottenham          82

                                                                      home_team  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa           Bournemouth
                          2015-08-08 Chelsea-Swansea                      Chelsea
                          2015-08-08 Everton-Watford                      Everton
                          2015-08-08 Leicester-Sunderland                Leicester
                          2015-08-08 Manchester United-Tottenham  Manchester United

                                                                    away_team  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa      Aston Villa
                          2015-08-08 Chelsea-Swansea                  Swansea
                          2015-08-08 Everton-Watford                  Watford
                          2015-08-08 Leicester-Sunderland          Sunderland
                          2015-08-08 Manchester United-Tottenham    Tottenham

                                                                 away_team_code  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa               AVL
                          2015-08-08 Chelsea-Swansea                      SWA
                          2015-08-08 Everton-Watford                      WAT
                          2015-08-08 Leicester-Sunderland                 SUN
                          2015-08-08 Manchester United-Tottenham          TOT

                                                                 home_team_code  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa               BOU
                          2015-08-08 Chelsea-Swansea                      CHE
                          2015-08-08 Everton-Watford                      EVE
                          2015-08-08 Leicester-Sunderland                 LEI
                          2015-08-08 Manchester United-Tottenham          MUN

                                                                        ...  \
league             season game                                          ...
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa           ...
                          2015-08-08 Chelsea-Swansea                   ...
                          2015-08-08 Everton-Watford                   ...
                          2015-08-08 Leicester-Sunderland              ...
                          2015-08-08 Manchester United-Tottenham       ...

                                                                  away_ppda  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa      11.846154
                          2015-08-08 Chelsea-Swansea               8.833333
                          2015-08-08 Everton-Watford              17.157895
                          2015-08-08 Leicester-Sunderland          9.555556
```

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```
                        2015-08-08 Manchester United-Tottenham    8.21875

                                                                  away_deep_completions ␣
↪\
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa                        2
                          2015-08-08 Chelsea-Swansea                               5
                          2015-08-08 Everton-Watford                               4
                          2015-08-08 Leicester-Sunderland                          6
                          2015-08-08 Manchester United-Tottenham                  10

                                                                  home_points  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa                0
                          2015-08-08 Chelsea-Swansea                       1
                          2015-08-08 Everton-Watford                       1
                          2015-08-08 Leicester-Sunderland                  3
                          2015-08-08 Manchester United-Tottenham           3

                                                                  home_expected_points  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa                   1.3912
                          2015-08-08 Chelsea-Swansea                          0.1836
                          2015-08-08 Everton-Watford                          1.3301
                          2015-08-08 Leicester-Sunderland                     2.1323
                          2015-08-08 Manchester United-Tottenham              1.2482

                                                                  home_goals  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa              0
                          2015-08-08 Chelsea-Swansea                     2
                          2015-08-08 Everton-Watford                     2
                          2015-08-08 Leicester-Sunderland                4
                          2015-08-08 Manchester United-Tottenham         1

                                                                   home_xg  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa     0.876106
                          2015-08-08 Chelsea-Swansea              0.64396
                          2015-08-08 Everton-Watford             0.604226
                          2015-08-08 Leicester-Sunderland         2.56803
                          2015-08-08 Manchester United-Tottenham 0.627539

                                                                  home_np_xg  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa       0.876106
                          2015-08-08 Chelsea-Swansea                0.64396
                          2015-08-08 Everton-Watford               0.604226
                          2015-08-08 Leicester-Sunderland           1.80686
                          2015-08-08 Manchester United-Tottenham   0.627539

                                                                  home_np_xg_difference ␣
```

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```
↪\
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa                   0.093853
                          2015-08-08 Chelsea-Swansea                          -1.1869
                          2015-08-08 Everton-Watford                          0.046334
                          2015-08-08 Leicester-Sunderland                       0.3474
                          2015-08-08 Manchester United-Tottenham              -0.047061

                                                                  home_ppda  \
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa            6.9
                          2015-08-08 Chelsea-Swansea               10.363636
                          2015-08-08 Everton-Watford                    6.65
                          2015-08-08 Leicester-Sunderland              10.88
                          2015-08-08 Manchester United-Tottenham   13.826087

                                                                  home_deep_completions
league             season game
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa                         11
                          2015-08-08 Chelsea-Swansea                                10
                          2015-08-08 Everton-Watford                                 5
                          2015-08-08 Leicester-Sunderland                            5
                          2015-08-08 Manchester United-Tottenham                     4

[5 rows x 26 columns]
```

2.8.5 Player season stats

[8]:
```
player_season_stats = understat.read_player_season_stats()
player_season_stats.head()
```

[8]:
```
                                        league_id  season_id       team  \
league             season player
ENG-Premier League 1516   Aaron Cresswell           1       2015   West Ham
                          Aaron Lennon              1       2015    Everton
                          Aaron Ramsey              1       2015    Arsenal
                          Abdul Rahman Baba         1       2015    Chelsea
                          Adam Bogdan               1       2015  Liverpool

                                         team_id  player_id position  \
league             season player
ENG-Premier League 1516   Aaron Cresswell     81        534      D M
                          Aaron Lennon        72        593    F M S
                          Aaron Ramsey        83        504      M S
                          Abdul Rahman Baba   80        684      D S
                          Adam Bogdan         87        698       GK

                                         matches  minutes  goals  \
league             season player
ENG-Premier League 1516   Aaron Cresswell     37     3319      2
                          Aaron Lennon        25     1534      5
```

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```
                         Aaron Ramsey            31     2624      5
                         Abdul Rahman Baba       15     1018      0
                         Adam Bogdan              2      180      0

                                                  xg  np_goals     np_xg  \
league             season player
ENG-Premier League 1516   Aaron Cresswell    1.092563         2  1.092563
                          Aaron Lennon       2.226095         5  2.226095
                          Aaron Ramsey       8.614323         5  8.614323
                          Abdul Rahman Baba  0.379115         0  0.379115
                          Adam Bogdan             0.0         0       0.0

                                           assists        xa  shots  \
league             season player
ENG-Premier League 1516   Aaron Cresswell        4  3.294618     28
                          Aaron Lennon           0  1.697951     18
                          Aaron Ramsey           4  4.046242     69
                          Abdul Rahman Baba      1  0.179241      6
                          Adam Bogdan            0       0.0      0

                                           key_passes  yellow_cards  \
league             season player
ENG-Premier League 1516   Aaron Cresswell          40             1
                          Aaron Lennon             23             1
                          Aaron Ramsey             37             4
                          Abdul Rahman Baba         3             1
                          Adam Bogdan               0             0

                                           red_cards   xg_chain  xg_buildup
league             season player
ENG-Premier League 1516   Aaron Cresswell          0  10.339367    6.831139
                          Aaron Lennon             0   5.535392     1.90374
                          Aaron Ramsey             0  23.282566   14.176444
                          Abdul Rahman Baba        0   3.869669    3.490554
                          Adam Bogdan              0   0.120216    0.120216
```

2.8.6 Player match stats

[9]:
```
player_match_stats = understat.read_player_match_stats()
player_match_stats.head()
```

[9]:
```
                                                                                ␣
↪   league_id  \
league             season game                              team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪           1
                                                                        Brad Guzan     ␣
↪           1
                                                                        Carlos Sánchez ␣
↪           1
                                                                        Ciaran Clark   ␣
```

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```
↪           1                                                                  Gabriel␣
↪Agbonlahor         1


↪    season_id  \
league              season game                                team         player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪          2015                                                               Brad Guzan     ␣
↪          2015                                                               Carlos Sánchez ␣
↪          2015                                                               Ciaran Clark   ␣
↪          2015                                                               Gabriel␣
↪Agbonlahor       2015


↪    game_id  \
league              season game                                team         player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪          82                                                                 Brad Guzan     ␣
↪          82                                                                 Carlos Sánchez ␣
↪          82                                                                 Ciaran Clark   ␣
↪          82                                                                 Gabriel␣
↪Agbonlahor       82


↪    team_id  \
league              season game                                team         player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪          71                                                                 Brad Guzan     ␣
↪          71                                                                 Carlos Sánchez ␣
↪          71                                                                 Ciaran Clark   ␣
↪          71                                                                 Gabriel␣
↪Agbonlahor       71


↪    player_id  \
league              season game                                team         player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪           669                                                               Brad Guzan     ␣
```

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```
↪          662                                                                  Carlos Sánchez ␣
↪          667                                                                  Ciaran Clark   ␣
↪          875                                                                  Gabriel␣
↪Agbonlahor        890                                                                          ␣
↪   position  \
league             season game                                 team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪          MC                                                                   Brad Guzan     ␣
↪          GK                                                                   Carlos Sánchez ␣
↪         Sub                                                                   Ciaran Clark   ␣
↪          DC                                                                   Gabriel␣
↪Agbonlahor       FW                                                                           ␣
↪    position_id  \
league             season game                                 team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪               9                                                               Brad Guzan     ␣
↪               1                                                               Carlos Sánchez ␣
↪              17                                                               Ciaran Clark   ␣
↪               3                                                               Gabriel␣
↪Agbonlahor            15                                                                      ␣
↪    minutes  \
league             season game                                 team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪          90                                                                   Brad Guzan     ␣
↪          90                                                                   Carlos Sánchez ␣
↪          18                                                                   Ciaran Clark   ␣
↪          90                                                                   Gabriel␣
↪Agbonlahor       90                                                                           ␣
↪    goals  \
```

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```
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪        0
                                                              Brad Guzan     ␣
↪        0
                                                              Carlos Sánchez ␣
↪        0
                                                              Ciaran Clark   ␣
↪        0
                                                              Gabriel␣
↪Agbonlahor      0


↪    own_goals  \
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪            0
                                                              Brad Guzan     ␣
↪            0
                                                              Carlos Sánchez ␣
↪            0
                                                              Ciaran Clark   ␣
↪            0
                                                              Gabriel␣
↪Agbonlahor          0


↪    shots  \
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪        0
                                                              Brad Guzan     ␣
↪        0
                                                              Carlos Sánchez ␣
↪        0
                                                              Ciaran Clark   ␣
↪        0
                                                              Gabriel␣
↪Agbonlahor      2


↪         xg  \
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪        0.0
                                                              Brad Guzan     ␣
↪        0.0
                                                              Carlos Sánchez ␣
↪        0.0
                                                              Ciaran Clark   ␣
↪        0.0
                                                              Gabriel␣
```

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```
↪Agbonlahor  0.13016

                                                                                                  ␣
↪          xa  \
league             season game                              team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪    0.374082
                                                                        Brad Guzan     ␣
↪         0.0
                                                                        Carlos Sánchez ␣
↪         0.0
                                                                        Ciaran Clark   ␣
↪         0.0
                                                                        Gabriel␣
↪Agbonlahor  0.113668

                                                                                                  ␣
↪    xg_chain  \
league             season game                              team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪    0.131937
                                                                        Brad Guzan     ␣
↪         0.0
                                                                        Carlos Sánchez ␣
↪         0.0
                                                                        Ciaran Clark   ␣
↪    0.131937
                                                                        Gabriel␣
↪Agbonlahor  0.243828

                                                                                                  ␣
↪    xg_buildup
league             season game                              team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Ashley Westwood␣
↪      0.131937
                                                                        Brad Guzan     ␣
↪           0.0
                                                                        Carlos Sánchez ␣
↪           0.0
                                                                        Ciaran Clark   ␣
↪      0.131937
                                                                        Gabriel␣
↪Agbonlahor         0.0
```

2.8.7 Shot events

[10]:
```
shot_events = understat.read_shot_events()
shot_events.head()
```

[10]:
```
                                                                                                    ␣
↪   league_id  \
league             season game                              team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor         1
                                                                        Gabriel␣
↪Agbonlahor         1
                                                                        Idrissa Gueye  ␣
↪           1
                                                                        Idrissa Gueye  ␣
↪           1
                                                                        Leandro Bacuna ␣
↪           1


                                                                                                    ␣
↪    season_id  \
league             season game                              team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor       2015
                                                                        Gabriel␣
↪Agbonlahor       2015
                                                                        Idrissa Gueye  ␣
↪         2015
                                                                        Idrissa Gueye  ␣
↪         2015
                                                                        Leandro Bacuna ␣
↪         2015


                                                                                                    ␣
↪    game_id  \
league             season game                              team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor       82
                                                                        Gabriel␣
↪Agbonlahor       82
                                                                        Idrissa Gueye  ␣
↪         82
                                                                        Idrissa Gueye  ␣
↪         82
                                                                        Leandro Bacuna ␣
↪         82


                                                                                                    ␣
↪                  date  \
league             season game                              team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor 2015-08-08 18:00:00
                                                                        Gabriel␣
```

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```
↪Agbonlahor 2015-08-08 18:00:00
                                                                    Idrissa Gueye  ␣
↪   2015-08-08 18:00:00
                                                                    Idrissa Gueye  ␣
↪   2015-08-08 18:00:00
                                                                    Leandro Bacuna ␣
↪   2015-08-08 18:00:00

                                                                                   ␣
↪    shot_id  \
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor   487146
                                                                    Gabriel␣
↪Agbonlahor   487150
                                                                    Idrissa Gueye  ␣
↪     487136
                                                                    Idrissa Gueye  ␣
↪     487144
                                                                    Leandro Bacuna ␣
↪     487141

                                                                                   ␣
↪    team_id  \
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor       71
                                                                    Gabriel␣
↪Agbonlahor       71
                                                                    Idrissa Gueye  ␣
↪         71
                                                                    Idrissa Gueye  ␣
↪         71
                                                                    Leandro Bacuna ␣
↪         71

                                                                                   ␣
↪    player_id  \
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor        890
                                                                    Gabriel␣
↪Agbonlahor        890
                                                                    Idrissa Gueye  ␣
↪          668
                                                                    Idrissa Gueye  ␣
↪          668
                                                                    Leandro Bacuna ␣
↪          674

                                                                                   ␣
↪    assist_player_id  \
```

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```
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor              <NA>
                                                                        Gabriel␣
↪Agbonlahor            548651
                                                                        Idrissa Gueye  ␣
↪              548653
                                                                        Idrissa Gueye  ␣
↪              548657
                                                                        Leandro Bacuna ␣
↪                <NA>

                                                                                       ␣
↪         assist_player  \
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor                <NA>
                                                                        Gabriel␣
↪Agbonlahor      Micah Richards
                                                                        Idrissa Gueye  ␣
↪       Jordan Veretout
                                                                        Idrissa Gueye  ␣
↪    Gabriel Agbonlahor
                                                                        Leandro Bacuna ␣
↪                 <NA>

                                                                                       ␣
↪          xg  \
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor  0.075484
                                                                        Gabriel␣
↪Agbonlahor  0.054676
                                                                        Idrissa Gueye  ␣
↪    0.018269
                                                                        Idrissa Gueye  ␣
↪    0.113668
                                                                        Leandro Bacuna ␣
↪    0.097371

                                                                                       ␣
↪    location_x  \
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor        0.86
                                                                        Gabriel␣
↪Agbonlahor       0.795
                                                                        Idrissa Gueye  ␣
↪         0.742
                                                                        Idrissa Gueye  ␣
↪         0.883
                                                                        Leandro Bacuna ␣
```

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```
↪         0.786

                                                                                ␣
↪    location_y  \
league             season game                                 team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor       0.503
                                                                        Gabriel␣
↪Agbonlahor       0.507
                                                                        Idrissa Gueye  ␣
↪         0.598
                                                                        Idrissa Gueye  ␣
↪         0.561
                                                                        Leandro Bacuna ␣
↪         0.437

                                                                                ␣
↪    minute  \
league             season game                                 team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor      67
                                                                        Gabriel␣
↪Agbonlahor      81
                                                                        Idrissa Gueye  ␣
↪        26
                                                                        Idrissa Gueye  ␣
↪        47
                                                                        Leandro Bacuna ␣
↪        42

                                                                                ␣
↪     body_part  \
league             season game                                 team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor   Left Foot
                                                                        Gabriel␣
↪Agbonlahor   Left Foot
                                                                        Idrissa Gueye  ␣
↪    Right Foot
                                                                        Idrissa Gueye  ␣
↪     Left Foot
                                                                        Leandro Bacuna ␣
↪    Right Foot

                                                                                ␣
↪          situation  \
league             season game                                 team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor        Open Play
                                                                        Gabriel␣
↪Agbonlahor        Open Play
                                                                        Idrissa Gueye  ␣
```

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```
↪          Open Play
                                                                    Idrissa Gueye  ␣
↪          Open Play
                                                                    Leandro Bacuna ␣
↪    Direct Freekick


                                                                                   ␣
↪          result
league             season game                                team        player
ENG-Premier League 1516   2015-08-08 Bournemouth-Aston Villa Aston Villa Gabriel␣
↪Agbonlahor  Blocked Shot
                                                                    Gabriel␣
↪Agbonlahor    Saved Shot
                                                                    Idrissa Gueye  ␣
↪     Missed Shot
                                                                    Idrissa Gueye  ␣
↪      Saved Shot
                                                                    Leandro Bacuna ␣
↪    Blocked Shot
```

doc/datasources/Understat.ipynb ends here.

The following section was generated from doc/datasources/WhoScored.ipynb

[3]:
```
import soccerdata as sd
```

2.9 WhoScored

[4]:
```
ws = sd.WhoScored(leagues="ENG-Premier League", seasons=2021)
print(ws.__doc__)
```

```
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/_common.py:462:␣
↪UserWarning: Season id "2021" is ambiguous: interpreting as "20-21"
  warnings.warn(msg)
```

```
Provides pd.DataFrames from data available at http://whoscored.com.

    Data will be downloaded as necessary and cached locally in
    ``~/soccerdata/data/WhoScored``.

    Parameters
    ----------
    leagues : string or iterable, optional
        IDs of Leagues to include.
    seasons : string, int or list, optional
        Seasons to include. Supports multiple formats.
        Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
    proxy : 'tor' or dict or list(dict) or callable, optional
        Use a proxy to hide your IP address. Valid options are:
            - "tor": Uses the Tor network. Tor should be running in
              the background on port 9050.
```

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```
            - dict: A dictionary with the proxy to use. The dict should be
              a mapping of supported protocols to proxy addresses. For example::

                  {
                      'http': 'http://10.10.1.10:3128',
                      'https': 'http://10.10.1.10:1080',
                  }

            - list(dict): A list of proxies to choose from. A different proxy will
              be selected from this list after failed requests, allowing rotating
              proxies.
            - callable: A function that returns a valid proxy. This function will
              be called after failed requests, allowing rotating proxies.
    no_cache : bool
        If True, will not use cached data.
    no_store : bool
        If True, will not store downloaded data.
    data_dir : Path
        Path to directory where data will be cached.
    path_to_browser : Path, optional
        Path to the Chrome executable.
    headless : bool, default: True
        If True, will run Chrome in headless mode. Setting this to False might
        help to avoid getting blocked.
```

2.9.1 Game schedule

[5]:
```
epl_schedule = ws.read_schedule()
epl_schedule.head()
```

[5]:
```
                                                                  game_id  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton        1485186
                          2020-09-12 Fulham-Arsenal                   1485187
                          2020-09-12 Liverpool-Leeds United           1485188
                          2020-09-12 West Ham United-Newcastle United 1485191
                          2020-09-13 Tottenham-Everton                1485189

                                                                        home_team  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton         Crystal Palace
                          2020-09-12 Fulham-Arsenal                           Fulham
                          2020-09-12 Liverpool-Leeds United                Liverpool
                          2020-09-12 West Ham United-Newcastle United  West Ham United
                          2020-09-13 Tottenham-Everton                      Tottenham

                                                                         away_team ␣
↪\
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton             Southampton
```

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```
                        2020-09-12 Fulham-Arsenal                              Arsenal
                        2020-09-12 Liverpool-Leeds United                  Leeds United
                        2020-09-12 West Ham United-Newcastle United  Newcastle United
                        2020-09-13 Tottenham-Everton                          Everton


                                                                                      ␣
↪date  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton       2020-09-12 15:00:00
                          2020-09-12 Fulham-Arsenal                  2020-09-12 12:30:00
                          2020-09-12 Liverpool-Leeds United          2020-09-12 17:30:00
                          2020-09-12 West Ham United-Newcastle United 2020-09-12 20:00:00
                          2020-09-13 Tottenham-Everton               2020-09-13 16:30:00


                                                                                      ␣
↪                            url  \
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton       https://www.
↪whoscored.com/Matches/1485186/Live...
                          2020-09-12 Fulham-Arsenal                  https://www.
↪whoscored.com/Matches/1485187/Live...
                          2020-09-12 Liverpool-Leeds United          https://www.
↪whoscored.com/Matches/1485188/Live...
                          2020-09-12 West Ham United-Newcastle United  https://www.
↪whoscored.com/Matches/1485191/Live...
                          2020-09-13 Tottenham-Everton               https://www.
↪whoscored.com/Matches/1485189/Live...


                                                                     stage
league             season game
ENG-Premier League 2021   2020-09-12 Crystal Palace-Southampton        NaN
                          2020-09-12 Fulham-Arsenal                    NaN
                          2020-09-12 Liverpool-Leeds United            NaN
                          2020-09-12 West Ham United-Newcastle United  NaN
                          2020-09-13 Tottenham-Everton                 NaN
```

2.9.2 Injured and suspended players

[6]:
```
missing_players = ws.read_missing_players(match_id=1485184)
missing_players.head()
```

[6]:
```
                                                                                      ␣
↪        game_id  \
league             season game                                team              player
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United Burnley           Charlie␣
↪Taylor  1485184
                                                                                  Dwight␣
↪McNeil   1485184
                                                                                  Jay␣
↪Rodriguez   1485184
                                                                                  Jimmy␣
```

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```
↪Dunne     1485184
                                                              Manchester United Eric␣
↪Bailly     1485184

                                                                                    ␣
↪         player_id  \
league             season game                                team             player
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United Burnley          Charlie␣
↪Taylor     107462
                                                                               Dwight␣
↪McNeil      357427
                                                                               Jay␣
↪Rodriguez       33891
                                                                               Jimmy␣
↪Dunne        366743
                                                              Manchester United Eric␣
↪Bailly        243814

                                                                                    ␣
↪                   reason  \
league             season game                                team             player
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United Burnley          Charlie␣
↪Taylor  injured doubtful
                                                                               Dwight␣
↪McNeil   injured doubtful
                                                                               Jay␣
↪Rodriguez   injured doubtful
                                                                               Jimmy␣
↪Dunne     injured doubtful
                                                              Manchester United Eric␣
↪Bailly     injured doubtful

                                                                                    ␣
↪           status
league             season game                                team             player
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United Burnley          Charlie␣
↪Taylor  Doubtful
                                                                               Dwight␣
↪McNeil   Doubtful
                                                                               Jay␣
↪Rodriguez   Doubtful
                                                                               Jimmy␣
↪Dunne     Doubtful
                                                              Manchester United Eric␣
↪Bailly     Doubtful
```

2.9.3 Match event stream data

[7]:
```
events = ws.read_events(match_id=1485184)
events.head()
```

[7]:
```
                                                                    period  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317   PreMatch
                                                              2253458375   PreMatch
                                                              2253487469  FirstHalf
                                                              2253487473  FirstHalf
                                                              2253487625  FirstHalf

                                                                    minute  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317       0
                                                              2253458375       0
                                                              2253487469       0
                                                              2253487473       0
                                                              2253487625       0

                                                                    expanded_
↪minute  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317
↪0
                                                              2253458375
↪0
                                                              2253487469
↪0
                                                              2253487473
↪0
                                                              2253487625
↪0

                                                                         type
↪\
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317  FormationSet
                                                              2253458375  FormationSet
                                                              2253487469         Start
                                                              2253487473         Start
                                                              2253487625          Pass

                                                                  outcome_type  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317   Successful
                                                              2253458375   Successful
                                                              2253487469   Successful
                                                              2253487473   Successful
                                                              2253487625   Successful

                                                                     team  \
```

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```
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317  Burnley
                                                              2253458375  Man Utd
                                                              2253487469  Burnley
                                                              2253487473  Man Utd
                                                              2253487625  Burnley


                                                                                  ␣
↪player  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317              ␣
↪NaN
                                                              2253458375              ␣
↪NaN
                                                              2253487469              ␣
↪NaN
                                                              2253487473              ␣
↪NaN
                                                              2253487625  Ashley␣
↪Westwood


                                                                                      ␣
↪                       qualifiers  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317  [{'type': {
↪'displayName': 'TeamPlayerFormation...
                                                              2253458375  [{'type': {
↪'displayName': 'CaptainPlayerId', '...
                                                              2253487469                ␣
↪                                 []
                                                              2253487473                ␣
↪                                 []
                                                              2253487625  [{'type': {
↪'displayName': 'Angle', 'value': 21...

                                                                                x  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317   0.0
                                                              2253458375   0.0
                                                              2253487469   0.0
                                                              2253487473   0.0
                                                              2253487625  50.3

                                                                                y  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317   0.0
                                                              2253458375   0.0
                                                              2253487469   0.0
                                                              2253487473   0.0
                                                              2253487625  50.3

                                                                            end_x  \
```

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```
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317    NaN
                                                              2253458375    NaN
                                                              2253487469    NaN
                                                              2253487473    NaN
                                                              2253487625   30.5

                                                                          end_y  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317    NaN
                                                              2253458375    NaN
                                                              2253487469    NaN
                                                              2253487473    NaN
                                                              2253487625   50.3

                                                                          goal_mouth_y␣
↪\
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317          NaN
                                                              2253458375          NaN
                                                              2253487469          NaN
                                                              2253487473          NaN
                                                              2253487625          NaN

                                                                          goal_mouth_z␣
↪\
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317          NaN
                                                              2253458375          NaN
                                                              2253487469          NaN
                                                              2253487473          NaN
                                                              2253487625          NaN

                                                                          is_touch  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317    False
                                                              2253458375    False
                                                              2253487469    False
                                                              2253487473    False
                                                              2253487625     True

                                                                         is_shot  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317    NaN
                                                              2253458375    NaN
                                                              2253487469    NaN
                                                              2253487473    NaN
                                                              2253487625    NaN

                                                                         is_goal  \
league             season game                                id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317    NaN
```

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```
                                                                  2253458375     NaN
                                                                  2253487469     NaN
                                                                  2253487473     NaN
                                                                  2253487625     NaN

                                                                              related_event_
↪id  \
league             season game                                  id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317              ␣
↪NaN
                                                                  2253458375              ␣
↪NaN
                                                                  2253487469              ␣
↪NaN
                                                                  2253487473              ␣
↪NaN
                                                                  2253487625              ␣
↪NaN

                                                                              related_
↪player_id  \
league             season game                                  id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317               ␣
↪NaN
                                                                  2253458375               ␣
↪NaN
                                                                  2253487469               ␣
↪NaN
                                                                  2253487473               ␣
↪NaN
                                                                  2253487625               ␣
↪NaN

                                                                              blocked_x  \
league             season game                                  id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317       NaN
                                                                  2253458375       NaN
                                                                  2253487469       NaN
                                                                  2253487473       NaN
                                                                  2253487625       NaN

                                                                              blocked_y  \
league             season game                                  id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317       NaN
                                                                  2253458375       NaN
                                                                  2253487469       NaN
                                                                  2253487473       NaN
                                                                  2253487625       NaN

                                                                            card_type  \
league             season game                                  id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317      NaN
```

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```
                                                                  2253458375       NaN
                                                                  2253487469       NaN
                                                                  2253487473       NaN
                                                                  2253487625       NaN

                                                                               game_id  \
league             season game                                  id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317  1485184
                                                                  2253458375  1485184
                                                                  2253487469  1485184
                                                                  2253487473  1485184
                                                                  2253487625  1485184

                                                                               team_id  \
league             season game                                  id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317      184
                                                                  2253458375       32
                                                                  2253487469      184
                                                                  2253487473       32
                                                                  2253487625      184

                                                                            player_id
league             season game                                  id
ENG-Premier League 2021   2021-01-12 Burnley-Manchester United 2253458317        NaN
                                                                  2253458375        NaN
                                                                  2253487469        NaN
                                                                  2253487473        NaN
                                                                  2253487625    79050.0
```

Match event stream data can be returned in various formats, which can be selected with the "output_fmt" parameter.

- `events` (default): Returns a dataframe with all events.
- `raw`: Returns the original unformatted WhoScored JSON.
- `spadl`: Returns a dataframe with the SPADL representation of the original events.
- `atomic-spadl`: Returns a dataframe with the Atomic-SPADL representation of the original events.
- `loader`: Returns a `socceration.data.opta.OptaLoader` instance

[12]:
```
events = ws.read_events(match_id=1485184, output_fmt="raw")

import json
print(json.dumps(events[1485184][0], indent=2))
```

```
{
  "eventId": 2,
  "expandedMinute": 0,
  "id": 2253487473,
  "isTouch": false,
  "minute": 0,
  "outcomeType": {
    "displayName": "Successful",
    "value": 1
```

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```
  },
  "period": {
    "displayName": "FirstHalf",
    "value": 1
  },
  "qualifiers": [],
  "satisfiedEventsTypes": [],
  "second": 0,
  "teamId": 32,
  "type": {
    "displayName": "Start",
    "value": 32
  },
  "x": 0,
  "y": 0
}
```


[13]:
```
actions = ws.read_events(match_id=1485184, output_fmt='spadl')
actions.head()
```

[13]:

	game_id	original_event_id	period_id	time_seconds	team_id	player_id	start_x	end_x	start_y	end_y	type_id	result_id	bodypart_id	action_id	player	team
0	1485184	2253487625	1	0.0	184	79050.0	52.815	32.025	34.204	34.204	0	1	0	0	Ashley Westwood	Burnley
1	1485184	2253487639	1	2.0	184	131464.0	31.080	38.220	36.312	15.844	0	1	0	1	James Tarkowski	Burnley
2	1485184	NaN	1	4.5	184	80067.0	38.220	43.365	15.844	12.512	21	1	0	2	Matthew Lowton	Burnley
3	1485184	2253487685	1	7.0	184	80067.0	43.365	90.300	12.512	49.708	0	1	0	3	Matthew Lowton	Burnley
4	1485184	2253487689	1	11.0	184	93473.0	90.300	105.000	49.708	38.828	11	0	0	4	Robbie Brady	Burnley

[14]:
```
atomic_actions = ws.read_events(match_id=1485184, output_fmt='atomic-spadl')
atomic_actions.head()
```

[14]:

	game_id	original_event_id	action_id	period_id	time_seconds	team_id	player_id	x	y	dx	dy	type_id	bodypart_id
0	1485184	2253487625	0	1	0.00	184							
1	1485184	2253487625	1	1	1.00	184							
2	1485184	2253487639	2	1	2.00	184							
3	1485184	2253487639	3	1	3.25	184							
4	1485184	NaN	4	1	4.50	184							

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```
0    79050.0  52.815  34.204 -20.790   0.000        0            0
1   131464.0  32.025  34.204   0.000   0.000       23            0
2   131464.0  31.080  36.312   7.140 -20.468        0            0
3    80067.0  38.220  15.844   0.000   0.000       23            0
4    80067.0  38.220  15.844   5.145  -3.332       21            0

            player     team
0  Ashley Westwood  Burnley
1  James Tarkowski  Burnley
2  James Tarkowski  Burnley
3   Matthew Lowton  Burnley
4   Matthew Lowton  Burnley
```

[15]:
```
# Scrape all games and return a socceration.data.opta.OptaLoader
loader = ws.read_events(output_fmt='loader')

# Now use this loader to load the data
print("Games:")
df_games = loader.games(competition_id="ENG-Premier League", season_id="2021")
display(df_games.head())

print("Teams:")
df_teams = loader.teams(game_id=1485184)
display(df_teams.head())

print("Players:")
df_players = loader.players(game_id=1485184)
display(df_players.head())

print("Events:")
df_events = loader.events(game_id=1485184)
display(df_events.head())

# You can use the socceraction package to convert the events
# to SPADL and to compute xT or VAEP action values
```

```
Games:
   game_id  season_id      competition_id game_day           game_date  \
0  1485494       2021  ENG-Premier League     None 2021-04-04 12:00:00
1  1485300       2021  ENG-Premier League     None 2020-12-16 20:00:00
2  1485264       2021  ENG-Premier League     None 2020-12-06 19:15:00
3  1485519       2021  ENG-Premier League     None 2021-05-16 16:30:00
4  1485436       2021  ENG-Premier League     None 2021-03-19 20:00:00

   home_team_id  away_team_id  home_score  away_score  duration  \
0            18           184           3           2        98
1           170           211           0           0        95
2            26           161           4           0        97
3           175            26           1           2       102
4           170            19           1           2       100

          referee               venue  attendance      home_manager  \
```

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```
0  Andre Marriner  St. Mary's Stadium           0  Ralph Hasenhüttl
1    Robert Jones      Craven Cottage           0      Scott Parker
2    Craig Pawson             Anfield        2000      Jürgen Klopp
3       Mike Dean       The Hawthorns           0     Sam Allardyce
4     David Coote      Craven Cottage           0      Scott Parker

          away_manager
0           Sean Dyche
1        Graham Potter
2  Nuno Espírito Santo
3         Jürgen Klopp
4       Marcelo Bielsa
```

```
Teams:
```

```
   team_id team_name
0      184   Burnley
1       32   Man Utd
```

```
Players:
```

```
   game_id  team_id  player_id      player_name  is_starter  minutes_played  \
0  1485184      184     105720        Nick Pope        True             102
1  1485184      184      80067   Matthew Lowton        True             102
2  1485184      184      94935          Ben Mee        True             102
3  1485184      184     131464  James Tarkowski        True             102
4  1485184      184      24148     Erik Pieters        True             102

   jersey_number starting_position
0              1                GK
1              2                DR
2              6                DC
3              5                DC
4             23                DL
```

```
Events:
```

```
   game_id    event_id  period_id  team_id  player_id  type_id  \
0  1485184  2253487473          1       32        NaN       32
1  1485184  2253487469          1      184        NaN       32
2  1485184  2253487625          1      184    79050.0        1
3  1485184  2253487639          1      184   131464.0        1
4  1485184  2253487685          1      184    80067.0        1

            timestamp  minute  second  outcome  start_x  start_y  end_x  \
0 2021-01-12 20:15:00       0       0     True      0.0      0.0    0.0
1 2021-01-12 20:15:00       0       0     True      0.0      0.0    0.0
2 2021-01-12 20:15:00       0       0     True     50.3     50.3   30.5
3 2021-01-12 20:15:02       0       2     True     29.6     53.4   36.4
4 2021-01-12 20:15:07       0       7     True     41.3     18.4   86.0

   end_y                                          qualifiers  \
0    0.0                                                  {}
1    0.0                                                  {}
2   50.3  {213: '3.1', 178: True, 141: '50.3', 212: '20...
```

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```
3   23.3  {178: True, 213: '5.0', 212: '21.7', 141: '23...
4   73.1  {1: True, 213: '0.7', 56: 'Center', 178: True,...

   related_player_id  touch   shot   goal type_name
0                NaN  False  False  False     start
1                NaN  False  False  False     start
2                NaN   True  False  False      pass
3                NaN   True  False  False      pass
4                NaN   True  False  False      pass
```

[ ]:

doc/datasources/WhoScored.ipynb ends here.

CHAPTER

THREE

HOW-TO GUIDES

Here you'll find short answers to "How do I…?" types of questions. These how-to guides don't cover topics in depth – you'll find that material in the *API Reference*. However, these guides will help you quickly accomplish common tasks.

3.1 How to add custom leagues

SoccerData has built-in support to scrape data from the top-5 European leagues and the major international tournaments. The leagues available for each source can be listed with the *`available_leagues()`* class method.

```
import soccerdata as sd
sd.FBref.available_leagues()
>>> ['ENG-Premier League', 'ESP-La Liga', 'FRA-Ligue 1', 'GER-Bundesliga', 'ITA-Serie A']
```

This documentation explains how to add custom leagues.

> **Warning:** Note that you might encounter errors when trying to scrape data for the leagues you added yourself. This is because the data provided for these leagues might have a different structure. If you encounter such an error, please do not open an issue on GitHub, but try to fix it yourself.

3.1.1 Adding a new league

Additional leagues can configured in `SOCCERDATA_DIR/config/league_dict.json`. This file should contain a mapping between a generic name for the league and the identifier used internally by each data source (see below) that you want to support. For example, for the Dutch Eredivisie this would be:

```
{
  "NED-Eredivisie": {
    "ClubElo": "NED_1",
    "MatchHistory": "N1",
    "SoFIFA": "[Netherlands] Eredivisie",
    "FBref": "Eredivisie",
    "ESPN": "ned.1",
    "FiveThirtyEight": "eredivisie",
    "WhoScored": "Netherlands - Eredivisie",
    "Sofascore": "Eredivisie",
    "season_start": "Aug",
    "season_end": "May"
```

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```
  }
}
```

The `season_end` and `season_start` fields are optional. This should be the month in which the last game and first game of a season are played, respectively. If they are not provided, June is used as the last month of the season and July as the first one.

Now, restart your Python session and check whether it is added to available leagues by running the command below.

```
>>> import soccerdata as sd
>>> sd.FBref.available_leagues()
[..., 'NED-Eredivisie', ...]
```

3.1.2 Internal identifiers

Below are instructions on how to find the internal identifiers for each data source.

ClubElo
: The internal identifier has the format `{country_code}_{level}`. The get the country code, go to https://clubelo.com/, click on the league you want to add and take the three-letter code in the URL. For example, the URL for the Dutch Eredivisie is http://clubelo.com/NED which means that the country identifier is `NED`. The level is the number of the league, starting with 1 for the top league. The internal identifier for the Dutch Eredivisie is therefore `NED_1`.

MatchHistory
: The internal identifier has the format `{country_code}{level}`. Download the CSV file corresponding corresponding to the league you would like to add from https://www.football-data.co.uk/data.php and take the value in the `Div` column.

SoFIFA
: The internal identifier has the format `[{region}] {league name}`. Go to https://sofifa.com/api/league to get the list of available leagues. The `{region}` corresponds to the `nationName` field in the JSON response. The `{league name}` corresponds to the `value` field.

FBref
: Go to https://fbref.com/en/comps/ and take the value in the `Competition Name` column.

ESPN
: The internal identifier has the format `{country_code}.{level}`. Go to https://www.espn.com/soccer/competitions, click on the league you want to add and take the value in the URL after `/league/_/name/`.

FiveThirtyEight
: Go to https://projects.fivethirtyeight.com/soccer-predictions/, select the relevant league and take the value in the URL after `/soccer-predictions/`.

WhoScored
: Go to https://www.whoscored.com and use the JavaScript console to get the value of the `allRegions` variable. The internal identifier has the format `{region name} - {league name}`.

FotMob
: The internal identifier is identical in style to the general format: `[{region}]-{league name}`. Go to https://www.fotmob.com/api/allLeagues to get the list of available leagues. The `{region}` corresponds to the `ccode` field in the JSON response. The `{league name}` corresponds to the `name` field.

Sofascore
: Go to https://api.sofascore.com/api/v1/config/unique-tournaments/EN/football to get the list of major leagues

and tournaments. Access `uniqueTournaments` in the JSON response, and the `{league name}` corresponds to the `name` field.

3.1.3 Troubleshooting

If you add a new league and it doesn't show up in the list of available leagues, there are a few things you can do to debug the problem.

1. Make sure to reload the soccerdata module after you modify the `league_dict.json` file. The most straightforward way to do this is to restart your notebook or Python interpreter.
2. Check whether your `league_dict.json` file is at the correct location. If so, you should see this appear in the log messages when importing the soccerdata library.

```
>>> import soccerdata as sd
[11/25/22 11:49:12] INFO     Custom team name replacements loaded from <path>/
↪teamname_replacements.json.                                                  ␣
↪                                          _config.py:83
                    INFO     Custom league dict loaded from <path>/league_dict.json.
↪                                                                             ␣
↪                                    _config.py:153
```

3. Check whether the content of your `league_dict.json` file is valid JSON. You can check the file's syntax using Python's built-in `json.tool` module.

```
$ cat config/league_dict.json | python -m json.tool
Expecting ',' delimiter: line 1 column 10 (char 9)
```

3.2 How to use a proxy server

You can setup a SOCKS5 proxy with Tor. Checkout the installation guide on the Tor website for installation instructions. After installing Tor, make sure to start it up before scraping. This can easily be done by running the `tor` command from your terminal (in a separate window), Tor will start up and run on "localhost:9050" by default. Once Tor is running, you can enable the extension by setting `proxy='tor'`.

```
ws = sd.WhoScored(proxy='tor')
```

The code snippet above assumes you have a Tor proxy running on "localhost:9050". Many distributions indeed default to having a SOCKS proxy listening on port 9050, but some may not. In particular, the Tor Browser Bundle defaults to listening on port 9150. You can specify a custom host and port as

```
ws = sd.WhoScored(proxy={
    "http": "socks5://127.0.0.1:9150",
    "https": "socks5://127.0.0.1:9150",
})
```

CHAPTER

FOUR

DATA ANALYSIS EXAMPLES

Below is a gallery of examples of data analysis using the `soccerdata` package. If you have an example you would like to share, please submit a pull request to the SoccerData GitHub repository.

The following section was generated from `doc/examples/ClubElo - Evolution of current top teams.ipynb`

[2]:
```
import soccerdata as sd
```

[3]:
```
%matplotlib inline
%config InlineBackend.figure_format = 'retina'

import matplotlib.pyplot as plt
import pandas as pd
import seaborn as sns

sns.set_context("notebook")
sns.set_style("whitegrid")
```

4.1 Evolution of top team's Elo ratings

How did the current top 5 teams in the world develop over time?

[4]:
```
elo = sd.ClubElo()
current_elo = elo.read_by_date()
current_elo.head()
```

```
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/clubelo.py:18:␣
↪FutureWarning: The argument 'infer_datetime_format' is deprecated and will be removed␣
↪in a future version. A strict version of it is now the default, see https://pandas.
↪pydata.org/pdeps/0004-consistent-to-datetime-parsing.html. You can safely remove this␣
↪argument.
  return pd.read_csv(
```

[4]:

team	rank	country	level	elo	from	to
Man City	1.0	ENG	1	2079.984619	2023-06-11	2023-08-11
Liverpool	2.0	ENG	1	1949.932861	2023-06-11	2023-08-13
Bayern	3.0	GER	1	1937.012451	2023-05-28	2023-08-18
Arsenal	4.0	ENG	1	1928.216187	2023-06-11	2023-08-12
Real Madrid	5.0	ESP	1	1907.589233	2023-06-08	2023-08-12

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```
                         league
team
Man City     ENG-Premier League
Liverpool    ENG-Premier League
Bayern           GER-Bundesliga
Arsenal      ENG-Premier League
Real Madrid         ESP-La Liga
```

[5]:
```
num_teams = 5
smoothing = 100
elo_top_development = pd.concat(
    [elo.read_team_history(team)['elo'].rolling(smoothing).mean()
     for team in current_elo.reset_index()['team'][:num_teams]
    ],
    axis=1)
elo_top_development.columns = current_elo.reset_index()['team'][:num_teams]
elo_top_development.fillna(method='ffill')

fig = plt.figure(figsize=(16, 10))
ax1 = fig.add_subplot(111, ylabel='ELO rolling avg.', xlabel='Date')
elo_top_development.plot(ax=ax1)
ax1.legend(loc='upper left', frameon=False, bbox_to_anchor=(0, 1.05), ncol=num_teams)
sns.despine();
```

```
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/clubelo.py:18:␣
↪FutureWarning: The argument 'infer_datetime_format' is deprecated and will be removed␣
↪in a future version. A strict version of it is now the default, see https://pandas.
↪pydata.org/pdeps/0004-consistent-to-datetime-parsing.html. You can safely remove this␣
↪argument.
  return pd.read_csv(
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/clubelo.py:18:␣
↪FutureWarning: The argument 'infer_datetime_format' is deprecated and will be removed␣
↪in a future version. A strict version of it is now the default, see https://pandas.
↪pydata.org/pdeps/0004-consistent-to-datetime-parsing.html. You can safely remove this␣
↪argument.
  return pd.read_csv(
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/clubelo.py:18:␣
↪FutureWarning: The argument 'infer_datetime_format' is deprecated and will be removed␣
↪in a future version. A strict version of it is now the default, see https://pandas.
↪pydata.org/pdeps/0004-consistent-to-datetime-parsing.html. You can safely remove this␣
↪argument.
  return pd.read_csv(
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/clubelo.py:18:␣
↪FutureWarning: The argument 'infer_datetime_format' is deprecated and will be removed␣
↪in a future version. A strict version of it is now the default, see https://pandas.
↪pydata.org/pdeps/0004-consistent-to-datetime-parsing.html. You can safely remove this␣
↪argument.
  return pd.read_csv(
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/clubelo.py:18:␣
↪FutureWarning: The argument 'infer_datetime_format' is deprecated and will be removed␣
↪in a future version. A strict version of it is now the default, see https://pandas.
```

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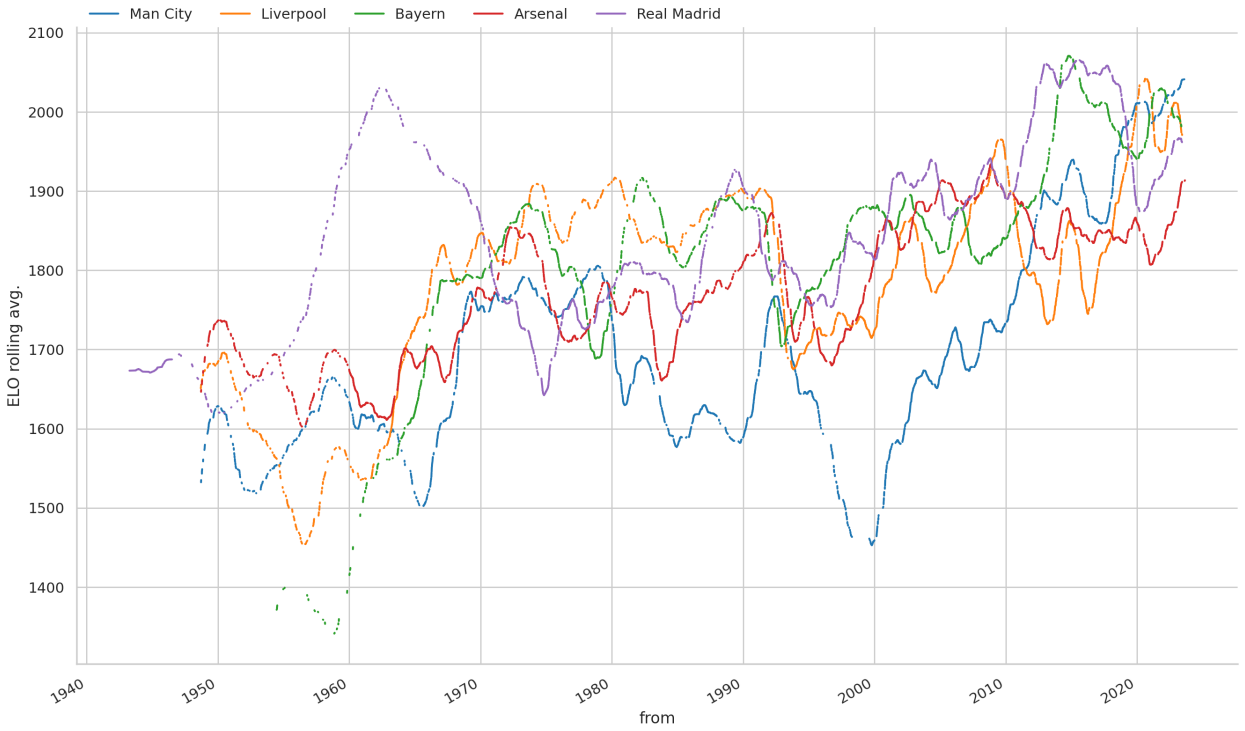
```
↪pydata.org/pdeps/0004-consistent-to-datetime-parsing.html. You can safely remove this␣
↪argument.
  return pd.read_csv(
```



doc/examples/ClubElo - Evolution of current top teams.ipynb ends here.

The following section was generated from doc/examples/MatchHistory - Home advantage.ipynb

[2]:
```
import soccerdata as sd
```

[3]:
```
%matplotlib inline
%config InlineBackend.figure_format = 'retina'

import matplotlib.pyplot as plt
import pandas as pd
import seaborn as sns

sns.set_context("notebook")
sns.set_style("whitegrid")
```

4.2 Home team advantage in the Italian Serie A

We all know sports teams have an advantage when playing at home. Here's a look at home team advantage for 5 years of the Serie A.

[4]:
```
seriea_hist = sd.MatchHistory('ITA-Serie A', range(2018, 2023))
games = seriea_hist.read_games()
games.sample(5)
```

```
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/soccerdata/_common.py:471:␣
↪UserWarning: Season id "2021" is ambiguous: interpreting as "20-21"
  warnings.warn(msg, stacklevel=1)
```

[4]:

league	season	game	date	home_team	away_team	FTHG	FTAG	FTR	HTHG	HTAG	HTR	HS	...	AvgC<2.5	AHCh	B365CAHH	B365CAHA	PCAHH	PCAHA	MaxCAHH	MaxCAHA	AvgCAHH
ITA-Serie A	1819	2018-12-22 Lazio-Cagliari	2018-12-22 12:00:00	Lazio	Cagliari	3	1	H	2	0	H	15	...	NaN	NaN	NaN	NaN	NaN	NaN			
	2021	2020-12-20 Torino-Bologna	2020-12-20 11:30:00	Torino	Bologna	1	1	D	0	0	D	13	...	2.25	0.0	1.91	2.02	1.92	2.0			
	1819	2019-03-03 Udinese-Bologna	2019-03-03 12:00:00	Udinese	Bologna	2	1	H	1	1	D	11	...	NaN	NaN	NaN	NaN	NaN	NaN			
	2021	2021-02-20 Genoa-Verona	2021-02-20 17:00:00	Genoa	Verona	2	2	D	0	1	A	12	...	1.64	0.0	1.95	1.98	1.93	2.0			
	1819	2019-03-10 Fiorentina-Lazio	2019-03-10 12:00:00	Fiorentina	Lazio	1	1	D	0	1	A	7	...	NaN	NaN	NaN	NaN	NaN	NaN			

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```
league      season game
ITA-Serie A 1819   2018-12-22 Lazio-Cagliari        NaN      NaN      NaN
            2021   2020-12-20 Torino-Bologna       1.94     2.11     1.86
            1819   2019-03-03 Udinese-Bologna       NaN      NaN      NaN
            2021   2021-02-20 Genoa-Verona         2.07     2.00     1.93
            1819   2019-03-10 Fiorentina-Lazio      NaN      NaN      NaN

                                                 AvgCAHA
league      season game
ITA-Serie A 1819   2018-12-22 Lazio-Cagliari        NaN
            2021   2020-12-20 Torino-Bologna       2.00
            1819   2019-03-03 Udinese-Bologna       NaN
            2021   2021-02-20 Genoa-Verona         1.93
            1819   2019-03-10 Fiorentina-Lazio      NaN

[5 rows x 121 columns]
```

[5]:
```
def home_away_results(games: pd.DataFrame):
    """Returns aggregated home/away results per team"""

    res = (
        pd.melt(games.reset_index(),
                id_vars=['date', 'FTR'],
                value_name='team', var_name='is_home',
                value_vars=['home_team', 'away_team']))

    res.is_home = res.is_home.replace(['home_team', 'away_team'], ['Home', 'Away'])
    res['win'] = res['lose'] = res['draw'] = 0
    res.loc[(res['is_home'] == 'Home') & (res['FTR'] == 'H'), 'win'] = 1
    res.loc[(res['is_home'] == 'Away') & (res['FTR'] == 'A'), 'win'] = 1
    res.loc[(res['is_home'] == 'Home') & (res['FTR'] == 'A'), 'lose'] = 1
    res.loc[(res['is_home'] == 'Away') & (res['FTR'] == 'H'), 'lose'] = 1
    res.loc[res['FTR'] == 'D', 'draw'] = 1

    g = res.groupby(['team', 'is_home'])
    w = (g.win.agg(['sum', 'mean'])
         .rename(columns={'sum': 'n_win', 'mean': 'win_pct'}))
    l = (g.lose.agg(['sum', 'mean'])
         .rename(columns={'sum': 'n_lose', 'mean': 'lose_pct'}))
    d = (g.draw.agg(['sum', 'mean'])
         .rename(columns={'sum': 'n_draw', 'mean': 'draw_pct'}))

    res = pd.concat([w, l, d], axis=1)
    return res
```

[6]:
```
results = home_away_results(games)
results.head(6)
```

[6]:

team	is_home	n_win	win_pct	n_lose	lose_pct	n_draw	draw_pct
Atalanta	Away	52	0.547368	16	0.168421	27	0.284211
	Home	56	0.589474	23	0.242105	16	0.168421

(continues on next page)

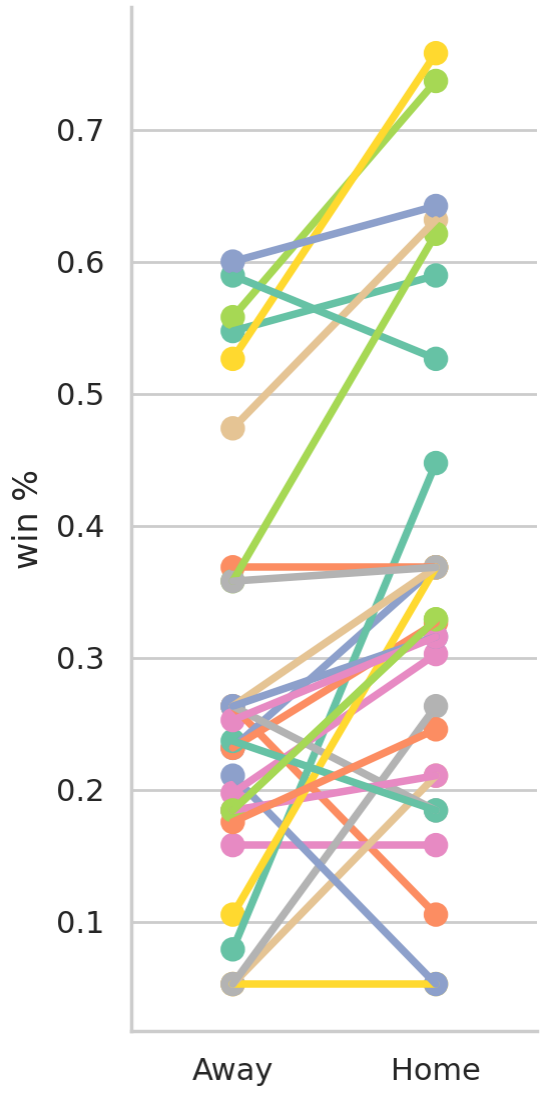
(continued from previous page)

```
Benevento  Away        10  0.263158      18  0.473684      10  0.263158
           Home         4  0.105263      20  0.526316      14  0.368421
Bologna    Away        22  0.231579      48  0.505263      25  0.263158
           Home        35  0.368421      29  0.305263      31  0.326316
```

The overall picture shows most teams have a clear advantage at home:

[7]:
```
g = sns.FacetGrid(results.reset_index(), hue='team', palette='Set2', height=6, aspect=.5)
g.map(sns.pointplot, 'is_home', 'win_pct', order=["Away", "Home"])
g.set_axis_labels('', 'win %');
```

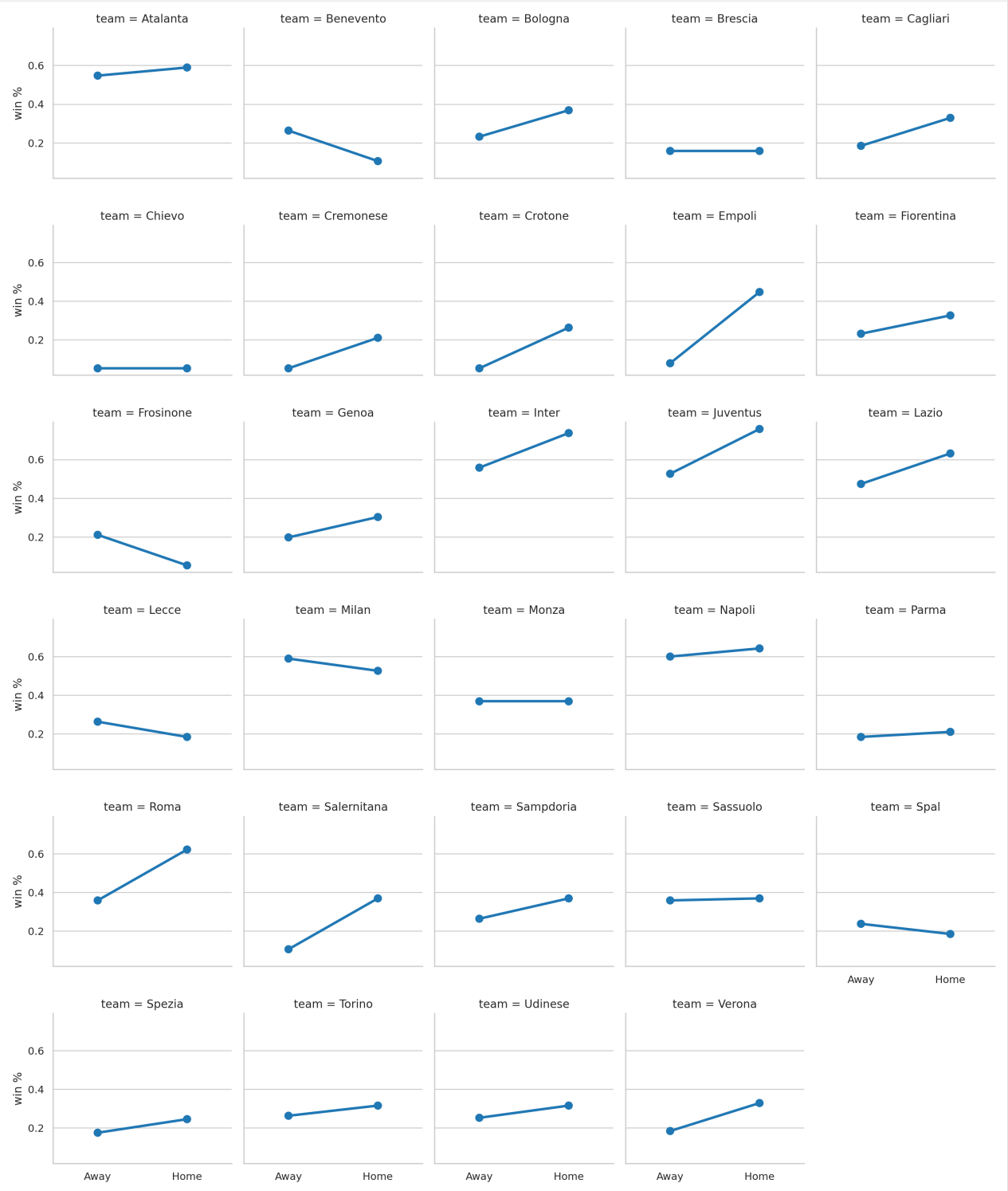
```
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/.venv/lib/python3.11/site-
↪packages/seaborn/axisgrid.py:118: UserWarning: The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```



But there are a few exceptions.

[8]:
```
g = sns.FacetGrid(results.reset_index(), col='team', col_wrap=5)
g.map(sns.pointplot, 'is_home', 'win_pct', order=["Away", "Home"])
g.set_axis_labels('', 'win %');
```

```
/cw/dtaijupiter/NoCsBack/dtai/pieterr/Projects/soccerdata/.venv/lib/python3.11/site-
↪packages/seaborn/axisgrid.py:118: UserWarning: The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```



doc/examples/MatchHistory - Home advantage.ipynb ends here.

CHAPTER

FIVE

API REFERENCE

This part of the documentation covers all the interfaces of the implemented data scrapers.

5.1 Club Elo

class soccerdata.**ClubElo**(*proxy=None*, *no_cache=False*, *no_store=False*, *data_dir=PosixPath('/home/docs/soccerdata/data/ClubElo')*)

Provides pd.DataFrames from CSV API at http://api.clubelo.com.

Data will be downloaded as necessary and cached locally in ~/soccerdata/data/ClubElo.

Since the source does not provide league names, this class will not filter by league. League names will be inserted from the other sources where available. Leagues that are only covered by clubelo.com will have NaN values.

Parameters

- **proxy** (*'tor' or dict or list(dict) or callable, optional*) –

  Use a proxy to hide your IP address. Valid options are:

  - "tor": Uses the Tor network. Tor should be running in the background on port 9050.
  - dict: A dictionary with the proxy to use. The dict should be a mapping of supported protocols to proxy addresses. For example:

    ```
    {
        'http': 'http://10.10.1.10:3128',
        'https': 'http://10.10.1.10:1080',
    }
    ```

  - list(dict): A list of proxies to choose from. A different proxy will be selected from this list after failed requests, allowing rotating proxies.
  - callable: A function that returns a valid proxy. This function will be called after failed requests, allowing rotating proxies.
- **no_cache** (*bool*) – If True, will not use cached data.
- **no_store** (*bool*) – If True, will not store downloaded data.
- **data_dir** (*Path*) – Path to directory where data will be cached.

read_by_date(*date=None*)

Retrieve ELO scores for all teams at specified date.

Elo scores are available as early as 1939. Values before 1960 should be considered provisional.

Parameters
date (*datetime object or string like 'YYYY-MM-DD'*) – Date for which to retrieve ELO scores. If no date is specified, get today's scores.

Raises
- **TypeError** – If date is not a date string or datetime object.
- **ValueError** – If data is an invalid date string.

Return type
pd.DataFrame

read_team_history(*team*, *max_age=1*)

Retrieve full ELO history for one club.

For the exact spelling of a club's name, check the result of *read_by_date()* or clubelo.com. You can also use alternative team names specified in *teamname_replacements.json*. Values before 1960 should be considered provisional.

Parameters
- **team** (*str*) – The club's name.
- **max_age** (*int for age in days, or timedelta object*) – The max. age of locally cached file before re-download.

Raises
- **TypeError** – If max_age is not an integer or timedelta object.
- **ValueError** – If no ratings for the given team are available.

Return type
pd.DataFrame

classmethod available_leagues()

Return a list of league IDs available for this source.

Return type
List[str]

get(*url*, *filepath=None*, *max_age=None*, *no_cache=False*, *var=None*)

Load data from *url*.

By default, the source of *url* is downloaded and saved to *filepath*. If *filepath* exists, the *url* is not visited and the cached data is returned.

Parameters
- **url** (*str*) – URL to download.
- **filepath** (*Path, optional*) – Path to save downloaded file. If None, downloaded data is not cached.
- **max_age** (*int for age in days, or timedelta object*) – The max. age of locally cached file before re-download.
- **no_cache** (*bool*) – If True, will not use cached data. Overrides the class property.
- **var** (*str or list of str, optional*) – Return a JavaScript variable instead of the page source.

Raises
TypeError – If max_age is not an integer or timedelta object.

Returns
File-like object of downloaded data.

Return type
io.BufferedIOBase

property leagues: List[str]
Return a list of selected leagues.

property seasons: List[str]
Return a list of selected seasons.

5.2 ESPN

class soccerdata.**ESPN**(*leagues=None*, *seasons=None*, *proxy=None*, *no_cache=False*, *no_store=False*, *data_dir=PosixPath('/home/docs/soccerdata/data/ESPN')*)

Provides pd.DataFrames from JSON api available at http://site.api.espn.com.

Data will be downloaded as necessary and cached locally in ~/soccerdata/data/ESPN.

Parameters

- **leagues** (*string or iterable, optional*) – IDs of leagues to include.
- **seasons** (*string, int or list, optional*) – Seasons to include. Supports multiple formats. Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
- **proxy** (*'tor' or dict or list(dict) or callable, optional*) –

  Use a proxy to hide your IP address. Valid options are:

  - "tor": Uses the Tor network. Tor should be running in the background on port 9050.
  - dict: A dictionary with the proxy to use. The dict should be a mapping of supported protocols to proxy addresses. For example:

    ```
    {
        'http': 'http://10.10.1.10:3128',
        'https': 'http://10.10.1.10:1080',
    }
    ```

  - list(dict): A list of proxies to choose from. A different proxy will be selected from this list after failed requests, allowing rotating proxies.
  - callable: A function that returns a valid proxy. This function will be called after failed requests, allowing rotating proxies.
- **no_cache** (*bool*) – If True, will not use cached data.
- **no_store** (*bool*) – If True, will not store downloaded data.
- **data_dir** (*Path*) – Path to directory where data will be cached.

property seasons: List[str]
Return a list of selected seasons.

read_schedule(*force_cache=False*)
Retrieve the game schedule for the selected leagues and seasons.

Parameters
force_cache (*bool*) – By default no cached data is used for the current season. If True, will force the use of cached data anyway.

Return type
pd.DataFrame

read_matchsheet(*match_id=None*)

Retrieve match sheets for the selected leagues and seasons.

Parameters
match_id (*int or list of int, optional*) – Retrieve the match sheet for a specific game.

Raises
ValueError – If no games with the given IDs were found for the selected seasons and leagues.

Return type
pd.DataFrame.

read_lineup(*match_id=None*)

Retrieve lineups for the selected leagues and seasons.

Parameters
match_id (*int or list of int, optional*) – Retrieve the lineup for a specific game.

Raises
ValueError – If no games with the given IDs were found for the selected seasons and leagues.

Return type
pd.DataFrame.

classmethod available_leagues()

Return a list of league IDs available for this source.

Return type
List[str]

get(*url*, *filepath=None*, *max_age=None*, *no_cache=False*, *var=None*)

Load data from *url*.

By default, the source of *url* is downloaded and saved to *filepath*. If *filepath* exists, the *url* is not visited and the cached data is returned.

Parameters

- **url** (*str*) – URL to download.
- **filepath** (*Path, optional*) – Path to save downloaded file. If None, downloaded data is not cached.
- **max_age** (*int for age in days, or timedelta object*) – The max. age of locally cached file before re-download.
- **no_cache** (*bool*) – If True, will not use cached data. Overrides the class property.
- **var** (*str or list of str, optional*) – Return a JavaScript variable instead of the page source.

Raises
TypeError – If max_age is not an integer or timedelta object.

Returns
File-like object of downloaded data.

Return type
io.BufferedIOBase

`property leagues: List[str]`

Return a list of selected leagues.

5.3 FBref

`class soccerdata.FBref(leagues=None, seasons=None, proxy=None, no_cache=False, no_store=False, data_dir=PosixPath('/home/docs/soccerdata/data/FBref'))`

Provides pd.DataFrames from data at http://fbref.com.

Data will be downloaded as necessary and cached locally in `~/soccerdata/data/FBref`.

Parameters

- **leagues** (*string or iterable, optional*) – IDs of leagues to include. For efficiently reading data from the Top-5 European leagues, use "Big 5 European Leagues Combined".
- **seasons** (*string, int or list, optional*) – Seasons to include. Supports multiple formats. Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
- **proxy** (*'tor' or dict or list(dict) or callable, optional*) –

  Use a proxy to hide your IP address. Valid options are:

  - "tor": Uses the Tor network. Tor should be running in the background on port 9050.
  - dict: A dictionary with the proxy to use. The dict should be a mapping of supported protocols to proxy addresses. For example:

    ```
    {
        'http': 'http://10.10.1.10:3128',
        'https': 'http://10.10.1.10:1080',
    }
    ```

  - list(dict): A list of proxies to choose from. A different proxy will be selected from this list after failed requests, allowing rotating proxies.
  - callable: A function that returns a valid proxy. This function will be called after failed requests, allowing rotating proxies.
- **no_cache** (*bool*) – If True, will not use cached data.
- **no_store** (*bool*) – If True, will not store downloaded data.
- **data_dir** (*Path*) – Path to directory where data will be cached.

`read_leagues(split_up_big5=False)`

Retrieve selected leagues from the datasource.

Parameters
split_up_big5 (*bool*) – If True, it will load the "Big 5 European Leagues Combined" instead of each league individually.

Return type
pd.DataFrame

read_seasons(*split_up_big5=False*)

Retrieve the selected seasons for the selected leagues.

Parameters

split_up_big5 (*bool*) – If True, it will load the "Big 5 European Leagues Combined" instead of each league individually.

Return type

pd.DataFrame

read_team_season_stats(*stat_type='standard'*, *opponent_stats=False*)

Retrieve aggregated season stats for all teams in the selected leagues and seasons.

The following stat types are available:

- 'standard'
- 'keeper'
- 'keeper_adv'
- 'shooting'
- 'passing'
- 'passing_types'
- 'goal_shot_creation'
- 'defense'
- 'possession'
- 'playing_time'
- 'misc'

Parameters

- **stat_type** (*str*) – Type of stats to retrieve.
- **opponent_stats** (*bool*) – If True, will retrieve opponent stats.

Raises

ValueError – If `stat_type` is not valid.

Return type

pd.DataFrame

read_team_match_stats(*stat_type='schedule'*, *opponent_stats=False*, *team=None*, *force_cache=False*)

Retrieve the match logs for all teams in the selected leagues and seasons.

The following stat types are available:

- 'schedule'
- 'keeper'
- 'shooting'
- 'passing'
- 'passing_types'
- 'goal_shot_creation'
- 'defense'

- 'possession'
- 'misc'

Parameters

- **stat_type** (*str*) – Type of stats to retrieve.
- **opponent_stats** (*bool*) – If True, will retrieve opponent stats.
- **team** (*str or list of str, optional*) – Team(s) to retrieve. If None, will retrieve all teams.
- **force_cache** (*bool*) – By default no cached data is used for the current season. If True, will force the use of cached data anyway.

Raises

ValueError – If `stat_type` is not valid.

Return type

pd.DataFrame

read_player_season_stats(*stat_type='standard'*)

Retrieve players from the datasource for the selected leagues and seasons.

The following stat types are available:

- 'standard'
- 'shooting'
- 'passing'
- 'passing_types'
- 'goal_shot_creation'
- 'defense'
- 'possession'
- 'playing_time'
- 'misc'
- 'keeper'
- 'keeper_adv'

Parameters

stat_type (*str*) – Type of stats to retrieve.

Raises

TypeError – If `stat_type` is not valid.

Return type

pd.DataFrame

read_schedule(*force_cache=False*)

Retrieve the game schedule for the selected leagues and seasons.

Parameters

force_cache (*bool*) – By default no cached data is used for the current season. If True, will force the use of cached data anyway.

Return type
pd.DataFrame

`read_player_match_stats`(*stat_type='summary'*, *match_id=None*, *force_cache=False*)

Retrieve the match stats for the selected leagues and seasons.

The following stat types are available:

- 'summary'
- 'keepers'
- 'passing'
- 'passing_types'
- 'defense'
- 'possession'
- 'misc'

Parameters

- **stat_type** (*str*) – Type of stats to retrieve.
- **match_id** (*int or list of int, optional*) – Retrieve the event stream for a specific game.
- **force_cache** (*bool*) – By default no cached data is used to scrape the list of available games for the current season. If True, will force the use of cached data anyway.

Raises

- **ValueError** – If no games with the given IDs were found for the selected seasons and leagues.
- **TypeError** – If `stat_type` is not valid.

Return type
pd.DataFrame

`read_lineup`(*match_id=None*, *force_cache=False*)

Retrieve lineups for the selected leagues and seasons.

Parameters

- **match_id** (*int or list of int, optional*) – Retrieve the lineup for a specific game.
- **force_cache** (*bool*) – By default no cached data is used to scrape the list of available games for the current season. If True, will force the use of cached data anyway.

Raises
ValueError – If no games with the given IDs were found for the selected seasons and leagues.

Return type
pd.DataFrame.

`read_events`(*match_id=None*, *force_cache=False*)

Retrieve match events for the selected seasons or selected matches.

The data returned includes the timing of goals, cards and substitutions. Also includes the players who are involved in the event.

Parameters

- **match_id** (*int or list of int, optional*) – Retrieve the events for a specific game.
- **force_cache** (*bool*) – By default no cached data is used to scrape the list of available games for the current season. If True, will force the use of cached data anyway.

Raises
ValueError – If no games with the given IDs were found for the selected seasons and leagues.

Return type
pd.DataFrame.

read_shot_events(*match_id=None*, *force_cache=False*)

Retrieve shooting data for the selected seasons or selected matches.

The data returned includes who took the shot, when, with which body part and from how far away. Additionally, the player creating the chance and also the creation before this are included in the data.

Parameters

- **match_id** (*int or list of int, optional*) – Retrieve the shots for a specific game.
- **force_cache** (*bool*) – By default no cached data is used to scrape the list of available games for the current season. If True, will force the use of cached data anyway.

Raises
ValueError – If no games with the given IDs were found for the selected seasons and leagues.

Return type
pd.DataFrame.

classmethod available_leagues()

Return a list of league IDs available for this source.

Return type
List[str]

5.4 FiveThirtyEight

class soccerdata.**FiveThirtyEight**(*leagues=None*, *seasons=None*, *proxy=None*, *no_cache=False*, *no_store=False*, *data_dir=PosixPath('/home/docs/soccerdata/data/FiveThirtyEight')*)

Provides pd.DataFrames from FiveThirtyEight's "Club Soccer Predictions" project.

Data will be downloaded as necessary and cached locally in `~/soccerdata/data/FiveThirtyEight`.

Original project and background info: https://projects.fivethirtyeight.com/soccer-predictions/ and https://fivethirtyeight.com/features/how-our-club-soccer-projections-work/

Parameters

- **leagues** (*string or iterable, optional*) – IDs of leagues to include.
- **seasons** (*string, int or list, optional*) – Seasons to include. Supports multiple formats. Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
- **proxy** (*'tor' or dict or list(dict) or callable, optional*) –

  Use a proxy to hide your IP address. Valid options are:

- ”tor”: Uses the Tor network. Tor should be running in the background on port 9050.
- dict: A dictionary with the proxy to use. The dict should be a mapping of supported protocols to proxy addresses. For example:

```
{
    'http': 'http://10.10.1.10:3128',
    'https': 'http://10.10.1.10:1080',
}
```

- list(dict): A list of proxies to choose from. A different proxy will be selected from this list after failed requests, allowing rotating proxies.
- callable: A function that returns a valid proxy. This function will be called after failed requests, allowing rotating proxies.

- **no_cache** (*bool*) – If True, will not use cached data.
- **no_store** (*bool*) – If True, will not store downloaded data.
- **data_dir** (*Path*) – Path to directory where data will be cached.

read_games()

Retrieve all games for the selected leagues.

Return type
pd.DataFrame

read_forecasts()

Retrieve the forecasted results for the selected leagues.

Return type
pd.DataFrame

read_clinches()

Retrieve clinches for the selected leagues.

Return type
pd.DataFrame

classmethod available_leagues()

Return a list of league IDs available for this source.

Return type
List[str]

5.5 FotMob

class soccerdata.**FotMob**(*leagues=None*, *seasons=None*, *proxy=None*, *no_cache=False*, *no_store=False*, *data_dir=PosixPath('/home/docs/soccerdata/data/FotMob')*)

Provides pd.DataFrames from data available at http://www.fotmob.com.

Data will be downloaded as necessary and cached locally in `~/soccerdata/data/FotMob`.

Parameters

- **leagues** (*string or iterable, optional*) – IDs of Leagues to include.
- **seasons** (*string, int or list, optional*) – Seasons to include. Supports multiple formats. Examples: ‘16-17’; 2016; ‘2016-17’; [14, 15, 16]

- **proxy** (*'tor' or dict or list(dict) or callable, optional*) –

  Use a proxy to hide your IP address. Valid options are:

  - 'tor': Uses the Tor network. Tor should be running in the background on port 9050.
  - dict: A dictionary with the proxy to use. The dict should be a mapping of supported protocols to proxy addresses. For example:

    ```
    {
        'http': 'http://10.10.1.10:3128',
        'https': 'http://10.10.1.10:1080',
    }
    ```

  - list(dict): A list of proxies to choose from. A different proxy will be selected from this list after failed requests, allowing rotating proxies.
  - callable: A function that returns a valid proxy. This function will be called after failed requests, allowing rotating proxies.

- **no_cache** (*bool*) – If True, will not use cached data.
- **no_store** (*bool*) – If True, will not store downloaded data.
- **data_dir** (*Path*) – Path to directory where data will be cached.

read_leagues()

Retrieve the selected leagues from the datasource.

Return type
pd.DataFrame

read_seasons()

Retrieve the selected seasons for the selected leagues.

Return type
pd.DataFrame

read_league_table(*force_cache=False*)

Retrieve the league table for the selected leagues.

Parameters
force_cache (*bool*) – By default no cached data is used for the current season. If True, will force the use of cached data anyway.

Return type
pd.DataFrame

read_schedule(*force_cache=False*)

Retrieve the game schedule for the selected leagues and seasons.

Parameters
force_cache (*bool*) – By default no cached data is used for the current season. If True, will force the use of cached data anyway.

Return type
pd.DataFrame

read_team_match_stats(*stat_type='Top stats'*, *opponent_stats=True*, *team=None*, *force_cache=False*)

Retrieve the match stats for the selected leagues and seasons.

The following stat types are available:

- 'Top stats'
- 'Shots'
- 'Expected goals (xG)'
- 'Passes'
- 'Defence'
- 'Duels'
- 'Discipline'

Parameters

- **stat_type** (*str*) – Type of stats to retrieve.
- **opponent_stats** (*bool*) – If True, will retrieve opponent stats.
- **team** (*str or list of str, optional*) – Team(s) to retrieve. If None, will retrieve all teams.
- **force_cache** (*bool*) – By default no cached data is used to scrape the list of available games for the current season. If True, will force the use of cached data anyway.

Raises

- **TypeError** – If stat_type is not valid.
- **ValueError** – If no games with the given IDs were found for the selected seasons and leagues.

Return type
pd.DataFrame

classmethod available_leagues()

Return a list of league IDs available for this source.

Return type
List[str]

5.6 MatchHistory

class soccerdata.**MatchHistory**(*leagues=None*, *seasons=None*, *proxy=None*, *no_cache=False*, *no_store=False*, *data_dir=PosixPath('/home/docs/soccerdata/data/MatchHistory')*)

Provides pd.DataFrames from CSV files available at http://www.football-data.co.uk/data.php.

Data will be downloaded as necessary and cached locally in ~/soccerdata/data/MatchHistory.

Parameters

- **leagues** (*string or iterable*) – IDs of leagues to include.
- **seasons** (*string, int or list*) – Seasons to include. Supports multiple formats. Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
- **proxy** (*'tor' or dict or list(dict) or callable, optional*) –

  Use a proxy to hide your IP address. Valid options are:

  - "tor": Uses the Tor network. Tor should be running in the background on port 9050.

  - dict: A dictionary with the proxy to use. The dict should be a mapping of supported protocols to proxy addresses. For example:

```
{
    'http': 'http://10.10.1.10:3128',
    'https': 'http://10.10.1.10:1080',
}
```

  - list(dict): A list of proxies to choose from. A different proxy will be selected from this list after failed requests, allowing rotating proxies.
  - callable: A function that returns a valid proxy. This function will be called after failed requests, allowing rotating proxies.

- **no_cache** (*bool*) – If True, will not use cached data.
- **no_store** (*bool*) – If True, will not store downloaded data.
- **data_dir** (*Path, optional*) – Path to directory where data will be cached.

property seasons: List[str]

Return a list of selected seasons.

read_games()

Retrieve game history for the selected leagues and seasons.

Column names are explained here: http://www.football-data.co.uk/notes.txt

Return type
pd.DataFrame

classmethod available_leagues()

Return a list of league IDs available for this source.

Return type
List[str]

get(*url*, *filepath=None*, *max_age=None*, *no_cache=False*, *var=None*)

Load data from *url*.

By default, the source of *url* is downloaded and saved to *filepath*. If *filepath* exists, the *url* is not visited and the cached data is returned.

Parameters

- **url** (*str*) – URL to download.
- **filepath** (*Path, optional*) – Path to save downloaded file. If None, downloaded data is not cached.
- **max_age** (*int for age in days, or timedelta object*) – The max. age of locally cached file before re-download.
- **no_cache** (*bool*) – If True, will not use cached data. Overrides the class property.
- **var** (*str or list of str, optional*) – Return a JavaScript variable instead of the page source.

Raises
TypeError – If max_age is not an integer or timedelta object.

Returns
File-like object of downloaded data.

Return type
io.BufferedIOBase

`property leagues: List[str]`

Return a list of selected leagues.

5.7 Sofascore

`class soccerdata.Sofascore(leagues=None, seasons=None, proxy=None, no_cache=False, no_store=False, data_dir=PosixPath('/home/docs/soccerdata/data/Sofascore'))`

Provides pd.DataFrames from data available at http://www.sofascore.com.

Data will be downloaded as necessary and cached locally in `~/soccerdata/data/Sofascore`.

Parameters

- **leagues** (*string or iterable, optional*) – IDs of Leagues to include.
- **seasons** (*string, int or list, optional*) – Seasons to include. Supports multiple formats. Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
- **proxy** (*'tor' or dict or list(dict) or callable, optional*) –

  Use a proxy to hide your IP address. Valid options are:

  - 'tor': Uses the Tor network. Tor should be running in the background on port 9050.
  - dict: A dictionary with the proxy to use. The dict should be a mapping of supported protocols to proxy addresses. For example:

    ```
    {
        'http': 'http://10.10.1.10:3128',
        'https': 'http://10.10.1.10:1080',
    }
    ```

  - list(dict): A list of proxies to choose from. A different proxy will be selected from this list after failed requests, allowing rotating proxies.
  - callable: A function that returns a valid proxy. This function will be called after failed requests, allowing rotating proxies.
- **no_cache** (*bool*) – If True, will not use cached data.
- **no_store** (*bool*) – If True, will not store downloaded data.
- **data_dir** (*Path*) – Path to directory where data will be cached.

`read_leagues()`

Retrieve the selected leagues from the datasource.

Return type
pd.DataFrame

`read_seasons()`

Retrieve the selected seasons for the selected leagues.

Return type
pd.DataFrame

read_league_table(*force_cache=False*)

Retrieve the league table for the selected leagues.

Parameters
force_cache (*bool*) – By default no cached data is used for the current season. If True, will force the use of cached data anyway.

Return type
pd.DataFrame

read_schedule(*force_cache=False*)

Retrieve the game schedule for the selected leagues and seasons.

Parameters
force_cache (*bool*) – By default no cached data is used for the current season. If True, will force the use of cached data anyway.

Return type
pd.DataFrame

5.8 SoFIFA

class soccerdata.**SoFIFA**(*leagues=None*, *versions='latest'*, *proxy=None*, *no_cache=False*, *no_store=False*, *data_dir=PosixPath('/home/docs/soccerdata/data/SoFIFA')*)

Provides pd.DataFrames from data at http://sofifa.com.

Data will be downloaded as necessary and cached locally in `~/soccerdata/data/SoFIFA`.

Parameters

- **leagues** (*string or iterable, optional*) – IDs of leagues to include.
- **versions** (*string, int or list of int, optional*) – FIFA releases to include. Should be specified by their ID used in the URL (e.g., 230034). Alternatively, the string "all" can be used to include all versions and "latest" to include the latest version only. Defaults to "latest".
- **proxy** (*'tor' or dict or list(dict) or callable, optional*) –

  Use a proxy to hide your IP address. Valid options are:

  - "tor": Uses the Tor network. Tor should be running in the background on port 9050.
  - dict: A dictionary with the proxy to use. The dict should be a mapping of supported protocols to proxy addresses. For example:

    ```
    {
        'http': 'http://10.10.1.10:3128',
        'https': 'http://10.10.1.10:1080',
    }
    ```

  - list(dict): A list of proxies to choose from. A different proxy will be selected from this list after failed requests, allowing rotating proxies.
  - callable: A function that returns a valid proxy. This function will be called after failed requests, allowing rotating proxies.
- **no_cache** (*bool*) – If True, will not use cached data.
- **no_store** (*bool*) – If True, will not store downloaded data.

- **data_dir** (*Path*) – Path to directory where data will be cached.

read_leagues()

Retrieve selected leagues from the datasource.

Return type
pd.DataFrame

read_versions(*max_age=1*)

Retrieve available FIFA releases and rating updates.

Parameters
max_age (*int for age in days, or timedelta object*) – The max. age of the locally cached release history before a new version is downloaded.

Raises
TypeError – If max_age is not an integer or timedelta object.

Return type
pd.DataFrame

read_teams()

Retrieve all teams for the selected leagues.

Return type
pd.DataFrame

read_players(*team=None*)

Retrieve all players for the selected leagues.

Parameters
team (*str or list of str, optional*) – Team(s) to retrieve. If None, will retrieve all teams.

Raises
ValueError – If no data is found for the given team(s) in the selected leagues.

Return type
pd.DataFrame

classmethod available_leagues()

Return a list of league IDs available for this source.

Return type
List[str]

read_team_ratings()

Retrieve ratings for all teams in the selected leagues.

Return type
pd.DataFrame

read_player_ratings(*team=None*, *player=None*)

Retrieve ratings for players.

Parameters

- **team** (*str or list of str, optional*) – Team(s) to retrieve. If None, will retrieve all teams.
- **player** (*int or list of int, optional*) – Player(s) to retrieve. If None, will retrieve all players.

Return type
pd.DataFrame

5.9 Understat

class soccerdata.**Understat**(*leagues=None*, *seasons=None*, *proxy=None*, *no_cache=False*, *no_store=False*, *data_dir=PosixPath('/home/docs/soccerdata/data/Understat')*)

Provides pd.DataFrames from data at https://understat.com.

Data will be downloaded as necessary and cached locally in ~/soccerdata/data/Understat.

Parameters

- **proxy** (*'tor' or dict or list(dict) or callable, optional*) –

  Use a proxy to hide your IP address. Valid options are:

  - "tor": Uses the Tor network. Tor should be running in the background on port 9050.
  - dict: A dictionary with the proxy to use. The dict should be a mapping of supported protocols to proxy addresses. For example:

    ```
    {
        'http': 'http://10.10.1.10:3128',
        'https': 'http://10.10.1.10:1080',
    }
    ```

  - list(dict): A list of proxies to choose from. A different proxy will be selected from this list after failed requests, allowing rotating proxies.
  - callable: A function that returns a valid proxy. This function will be called after failed requests, allowing rotating proxies.
- **no_cache** (*bool*) – If True, will not use cached data.
- **no_store** (*bool*) – If True, will not store downloaded data.
- **data_dir** (*Path*) – Path to directory where data will be cached.
- **leagues** (*str | List[str] | None*) –
- **seasons** (*str | int | Iterable[str | int] | None*) –

property seasons: List[str]

Return a list of selected seasons.

read_leagues()

Retrieve the selected leagues from the datasource.

Return type
pd.DataFrame

read_seasons()

Retrieve the selected seasons from the datasource.

Return type
pd.DataFrame

read_schedule(*include_matches_without_data=True*, *force_cache=False*)

Retrieve the matches for the selected leagues and seasons.

Parameters

- **include_matches_without_data** (*bool*) – By default matches with and without data are returned. If False, will only return matches with data.
- **force_cache** (*bool*) – By default no cached data is used for the current season. If True, will force the use of cached data anyway.

Return type
pd.DataFrame

read_team_match_stats(*force_cache=False*)

Retrieve the team match stats for the selected leagues and seasons.

Parameters
force_cache (*bool*) – By default no cached data is used for the current season. If True, will force the use of cached data anyway.

Return type
pd.DataFrame

read_player_season_stats(*force_cache=False*)

Retrieve the player season stats for the selected leagues and seasons.

Parameters
force_cache (*bool*) – By default no cached data is used for the current season. If True, will force the use of cached data anyway.

Return type
pd.DataFrame

read_player_match_stats(*match_id=None*)

Retrieve the player match stats for the selected leagues and seasons.

Parameters
match_id (*int or list of int, optional*) – Retrieve the player match stats for a specific match.

Raises
ValueError – If the given match_id could not be found in the selected seasons.

Return type
pd.DataFrame

read_shot_events(*match_id=None*)

Retrieve the shot events for the selected matches or the selected leagues and seasons.

Parameters
match_id (*int or list of int, optional*) – Retrieve the shot events for a specific match.

Raises
ValueError – If the given match_id could not be found in the selected seasons.

Return type
pd.DataFrame

classmethod available_leagues()

Return a list of league IDs available for this source.

Return type
List[str]

get(*url*, *filepath=None*, *max_age=None*, *no_cache=False*, *var=None*)

Load data from *url*.

By default, the source of *url* is downloaded and saved to *filepath*. If *filepath* exists, the *url* is not visited and the cached data is returned.

Parameters

- **url** (*str*) – URL to download.
- **filepath** (*Path, optional*) – Path to save downloaded file. If None, downloaded data is not cached.
- **max_age** (*int for age in days, or timedelta object*) – The max. age of locally cached file before re-download.
- **no_cache** (*bool*) – If True, will not use cached data. Overrides the class property.
- **var** (*str or list of str, optional*) – Return a JavaScript variable instead of the page source.

Raises
TypeError – If max_age is not an integer or timedelta object.

Returns
File-like object of downloaded data.

Return type
io.BufferedIOBase

property leagues: List[str]

Return a list of selected leagues.

5.10 WhoScored

class soccerdata.**WhoScored**(*leagues=None*, *seasons=None*, *proxy=None*, *no_cache=False*, *no_store=False*, *data_dir=PosixPath('/home/docs/soccerdata/data/WhoScored')*, *path_to_browser=None*, *headless=False*)

Provides pd.DataFrames from data available at http://whoscored.com.

Data will be downloaded as necessary and cached locally in ~/soccerdata/data/WhoScored.

Parameters

- **leagues** (*string or iterable, optional*) – IDs of Leagues to include.
- **seasons** (*string, int or list, optional*) – Seasons to include. Supports multiple formats. Examples: '16-17'; 2016; '2016-17'; [14, 15, 16]
- **proxy** (*'tor' or dict or list(dict) or callable, optional*) –

  Use a proxy to hide your IP address. Valid options are:

  - "tor": Uses the Tor network. Tor should be running in the background on port 9050.

  - dict: A dictionary with the proxy to use. The dict should be a mapping of supported protocols to proxy addresses. For example:

```
{
    'http': 'http://10.10.1.10:3128',
    'https': 'http://10.10.1.10:1080',
}
```

  - list(dict): A list of proxies to choose from. A different proxy will be selected from this list after failed requests, allowing rotating proxies.
  - callable: A function that returns a valid proxy. This function will be called after failed requests, allowing rotating proxies.

- **no_cache** (*bool*) – If True, will not use cached data.
- **no_store** (*bool*) – If True, will not store downloaded data.
- **data_dir** (*Path*) – Path to directory where data will be cached.
- **path_to_browser** (*Path, optional*) – Path to the Chrome executable.
- **headless** (*bool, default: True*) – If True, will run Chrome in headless mode. Setting this to False might help to avoid getting blocked. Only supported for Selenium <4.13.

read_schedule(*force_cache=False*)

Retrieve the game schedule for the selected leagues and seasons.

Parameters
force_cache (*bool*) – By default no cached data is used for the current season. If True, will force the use of cached data anyway.

Return type
pd.DataFrame

read_missing_players(*match_id=None*, *force_cache=False*)

Retrieve a list of injured and suspended players ahead of each game.

Parameters

- **match_id** (*int or list of int, optional*) – Retrieve the missing players for a specific game.
- **force_cache** (*bool*) – By default no cached data is used to scrapre the list of available games for the current season. If True, will force the use of cached data anyway.

Raises
ValueError – If the given match_id could not be found in the selected seasons.

Return type
pd.DataFrame

read_events(*match_id=None*, *force_cache=False*, *live=False*, *output_fmt='events'*)

Retrieve the the event data for each game in the selected leagues and seasons.

Parameters

- **match_id** (*int or list of int, optional*) – Retrieve the event stream for a specific game.
- **force_cache** (*bool*) – By default no cached data is used to scrape the list of available games for the current season. If True, will force the use of cached data anyway.

- **live** (*bool*) – If True, will not return a cached copy of the event data. This is usefull to scrape live data.
- **output_fmt** (*str, default: 'events'*) –

  The output format of the returned data. Possible values are:

  - 'events' (default): Returns a dataframe with all events.
  - 'raw': Returns the original unformatted WhoScored JSON.
  - 'spadl': Returns a dataframe with the SPADL representation of the original events. See https://socceraction.readthedocs.io/en/latest/documentation/SPADL.html#spadl
  - 'atomic-spadl': Returns a dataframe with the Atomic-SPADL representation of the original events. See https://socceraction.readthedocs.io/en/latest/documentation/SPADL.html#atomic-spadl
  - 'loader': Returns a socceraction.data.opta.OptaLoader instance, which can be used to retrieve the actual data. See https://socceraction.readthedocs.io/en/latest/modules/generated/socceraction.data.opta.OptaLoader.html#socceraction.data.opta.OptaLoader # noqa: E501
  - None: Doesn't return any data. This is useful to just cache the data without storing the events in memory.

Raises

- **ValueError** – If the given match_id could not be found in the selected seasons.
- **ImportError** – If the requested output format is 'spadl', 'atomic-spadl' or 'loader' but the socceraction package is not installed.

Return type
See the description of the `output_fmt` parameter.

classmethod available_leagues()

Return a list of league IDs available for this source.

Return type
List[str]

If you would like to extend the functionality of soccerdata, you might also be interested in the following modules:

5.11 Base Readers

The logic for downloading data from the web is implemented in the base classes that are documented here. The base classes are not intended to be used directly but rather to be subclassed by the specific readers which implement the logic to parse the data.

The `BaseRequestsReader` is a wrapper around the *requests* library and is used by scrapers that do not require JavaScript to be executed. The `BaseSeleniumReader` is a wrapper around the *selenium* library and is used by scrapers that require JavaScript to be executed.

class soccerdata._common.**BaseRequestsReader**(*leagues=None*, *proxy=None*, *no_cache=False*, *no_store=False*, *data_dir=PosixPath('/home/docs/soccerdata/data')*)

Base class for readers that use the Python requests module.

Parameters

- **leagues** (*str | List[str] | None*) –
- **proxy** (*str | Dict[str, str] | List[Dict[str, str]] | Callable[[], Dict[str, str]] | None*) –
- **no_cache** (*bool*) –
- **no_store** (*bool*) –
- **data_dir** (*Path*) –

classmethod available_leagues()

Return a list of league IDs available for this source.

Return type
List[str]

get(*url*, *filepath=None*, *max_age=None*, *no_cache=False*, *var=None*)

Load data from *url*.

By default, the source of *url* is downloaded and saved to *filepath*. If *filepath* exists, the *url* is not visited and the cached data is returned.

Parameters

- **url** (*str*) – URL to download.
- **filepath** (*Path, optional*) – Path to save downloaded file. If None, downloaded data is not cached.
- **max_age** (*int for age in days, or timedelta object*) – The max. age of locally cached file before re-download.
- **no_cache** (*bool*) – If True, will not use cached data. Overrides the class property.
- **var** (*str or list of str, optional*) – Return a JavaScript variable instead of the page source.

Raises
TypeError – If max_age is not an integer or timedelta object.

Returns
File-like object of downloaded data.

Return type
io.BufferedIOBase

property leagues: List[str]

Return a list of selected leagues.

property seasons: List[str]

Return a list of selected seasons.

class soccerdata._common.**BaseSeleniumReader**(*leagues=None*, *proxy=None*, *no_cache=False*, *no_store=False*, *data_dir=PosixPath('/home/docs/soccerdata/data')*, *path_to_browser=None*, *headless=True*)

Base class for readers that use Selenium.

Parameters

- **leagues** (*str | List[str] | None*) –

- **proxy** (*str | Dict[str, str] | List[Dict[str, str]] | Callable[[], Dict[str, str]] | None*) –
- **no_cache** (*bool*) –
- **no_store** (*bool*) –
- **data_dir** (*Path*) –
- **path_to_browser** (*Path | None*) –
- **headless** (*bool*) –

classmethod available_leagues()

Return a list of league IDs available for this source.

Return type
List[str]

get(*url*, *filepath=None*, *max_age=None*, *no_cache=False*, *var=None*)

Load data from *url*.

By default, the source of *url* is downloaded and saved to *filepath*. If *filepath* exists, the *url* is not visited and the cached data is returned.

Parameters

- **url** (*str*) – URL to download.
- **filepath** (*Path, optional*) – Path to save downloaded file. If None, downloaded data is not cached.
- **max_age** (*int for age in days, or timedelta object*) – The max. age of locally cached file before re-download.
- **no_cache** (*bool*) – If True, will not use cached data. Overrides the class property.
- **var** (*str or list of str, optional*) – Return a JavaScript variable instead of the page source.

Raises
TypeError – If max_age is not an integer or timedelta object.

Returns
File-like object of downloaded data.

Return type
io.BufferedIOBase

property leagues: List[str]

Return a list of selected leagues.

property seasons: List[str]

Return a list of selected seasons.

5.12 Utilities

_common.**season_code**()

Convert a string or int to a season code like '1718'.

Parameters
season (*str | int*) –

Return type
str

_common.**make_game_id**()

Return a game id based on date, home and away team.

Parameters
row (*Series*) –

Return type
str

_common.**standardize_colnames**(*cols=None*)

Convert DataFrame column names to snake case.

Parameters

- **df** (*DataFrame*) –
- **cols** (*List[str] | None*) –

Return type
DataFrame

_common.**get_proxy**()

Return a public proxy.

Return type
Dict[str, str]

_common.**check_proxy**()

Check if proxy is working.

Parameters
proxy (*dict*) –

Return type
bool

CHAPTER

SIX

FAQ

Is web scraping legal?

Even though web scraping is ubiquitous, its legal status remains unclear. That is because whether web scraping is legal will depend on many aspects. It is always best to consult with a lawyer or legal expert to ensure that your web scraping activities are legal and comply with all applicable laws and regulations.

Something doesn't work

1. Have you updated to the newest version of soccerdata?
2. Clear the cache or run your script without caching enabled.
3. Does the log produce any warnings that sound like they might be related? Maybe the data you are looking for is not available or can not be processed correctly.
4. Open an issue on GitHub.

CHAPTER

SEVEN

CONTRIBUTOR GUIDE

This document lays out guidelines and advice for contributing to this project. If you're thinking of contributing, please start by reading this document and getting a feel for how contributing to this project works. If you have any questions, feel free to reach out to Pieter Robberechts, the primary maintainer.

The guide is split into sections based on the type of contribution you're thinking of making.

7.1 Bug Reports

Bug reports are hugely important! Before you raise one, though, please check through the GitHub issues, **both open and closed**, to confirm that the bug hasn't been reported before.

When filing an issue, make sure to answer these questions:

- Which Python version are you using?
- Which version of soccerdata are you using?
- What did you do?
- What did you expect to see?
- What did you see instead?

The best way to get your bug fixed is to provide a test case, and/or steps to reproduce the issue.

7.2 Feature Requests

If you believe there is a feature missing, feel free to raise a feature request on the Issue Tracker.

7.3 Documentation Contributions

Documentation improvements are always welcome! The documentation files live in the `docs/` directory of the codebase. They're written in reStructuredText, and use Sphinx to generate the full suite of documentation.

You do not have to setup a development environment to make small changes to the docs. Instead, you can edit files directly on GitHub and suggest changes.

When contributing documentation, please do your best to follow the style of the documentation files. This means a soft-limit of 79 characters wide in your text files and a semi-formal, yet friendly and approachable, prose style.

When presenting Python code, use single-quoted strings (`'hello'` instead of `"hello"`).

7.4 Code Contributions

If you intend to contribute code, do not feel the need to sit on your contribution until it is perfectly polished and complete. It helps everyone involved for you to seek feedback as early as you possibly can. Submitting an early, unfinished version of your contribution for feedback can save you from putting a lot of work into a contribution that is not suitable for the project.

7.4.1 Setting up your development environment

You need Python 3.7.1+ and the following tools:

- Poetry
- Nox
- nox-poetry

Install the package with development requirements:

```
$ poetry install
```

You can now run an interactive Python session.

```
$ poetry run python
```

7.4.2 Steps for submitting Code

When contributing code, you'll want to follow this checklist:

1. Fork the repository on GitHub.
2. Run the tests to confirm they all pass on your system. If they don't, you'll need to investigate why they fail. If you're unable to diagnose this yourself, raise it as a bug report.
3. Write tests that demonstrate your bug or feature. Ensure that they fail.
4. Make your change.
5. Run the entire test suite again, confirming that all tests pass *including the ones you just added*.
6. Make sure your code follows the code style discussed below.
7. Send a GitHub Pull Request to the main repository's `master` branch. GitHub Pull Requests are the expected method of code collaboration on this project.

7.4.3 Testing the project

Run the full test suite:

```
$ nox
```

List the available Nox sessions:

```
$ nox --list-sessions
```

You can also run a specific Nox session. For example, invoke the unit test suite like this:

```
$ nox --session=tests
```

Unit tests are located in the `tests` directory, and are written using the pytest testing framework.

7.4.4 Code style

The soccerdata codebase uses the PEP 8 code style. In addition, we have a few guidelines:

- Line-length can exceed 79 characters, to 100, when convenient.
- Line-length can exceed 100 characters, when doing otherwise would be *terribly* inconvenient.
- Always use single-quoted strings (e.g. `'#soccer'`), unless a single-quote occurs within the string.

To ensure all code conforms to this format. You can format the code using the pre-commit hooks.

```
$ nox --session=pre-commit
```

Docstrings are to follow the numpydoc guidelines.

7.4.5 Submitting changes

Open a pull request to submit changes to this project.

Your pull request needs to meet the following guidelines for acceptance:

- The Nox test suite must pass without errors and warnings.
- Include unit tests.
- If your changes add functionality, update the documentation accordingly.

Feel free to submit early, though. We can always iterate on this.

To run linting and code formatting checks before committing your change, you can install pre-commit as a Git hook by running the following command:

```
$ nox --session=pre-commit -- install
```

It is recommended to open an issue before starting work on anything.

CHAPTER

EIGHT

APACHE LICENSE

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