

Data Wrangling

Data Collection

- Built five web data scrapers using BeautifulSoup4 to collect all data for this project
 - Pro-football-reference.com referee and game data from 2006 onward
 - Profootballfocus.com game grades for every team dating back to 2006
 - Nflweather.com weather data for every game since 2007
 - Footballoutsiders.com DVOA metrics for every team and every game since 2006
- For missing values, I explored why they were missing and found a pattern that led me to changing the code in two of my scrapers.
 - Games that went into overtime had additional columns of data that I hadn't accounted for
- Put all data into .csv files and Pandas dataframes

Data Cleaning

- Used Pandas to import data from .csv files into dataframes using `.read_csv()`
- Performed dataframe column operations to create new variables
- Used string methods on dataframe columns to clean string variables
- Changed date columns from strings to datetime objects
- Replaced old team names with up-to-date team names for data consistency among all tables

- Used a dictionary that mapped all old team names to their current team name and applied the `.map()` function to the 'team' columns to transform the team column to a new, updated team column for every table
- Used joins and merges on tables of data to prepare data for analysis in the next part of this project