

Fantasy Football for Everyone

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Summary and Abstract

Football might be America's favorite sport to watch, but the rules can be confusing and difficult to learn for unfamiliar fans. While 58% of Americans engage in football games on a weekly basis, 73% are men aged 50 years or older. Fantasy football is a way for people to feel as though they are a general manager in football through creating their own team and competing against friends in a league for bragging rights or money. Playing fantasy football can be an incentive to watch NFL games, as people want to keep up with how their "players" are doing as well as a way for people to regularly socialize and experience camaraderie with others.

Our goal is to try and broaden the viewership of football by making fantasy football more inclusive and informative for fans who know less about the NFL or football rules in general. As fantasy incorporates predictive models evaluating players' week-by-week performance, we plan on creating our own interpretable version of these models using play-by-play NFL data. We also plan on evaluating data on past fantasy football leagues to analyze what patterns we see in teams that win their respective leagues. Our plan is to deliver a website or app providing enough guidance to allow a user without a football background to create a competitive and successful fantasy football team while gaining understanding of fantasy football as a whole.

Proposed Plan (Methods)

The primary objective of our project is to accurately predict the fantasy points earned by NFL players during a specific week. We intend to employ three distinct approaches to construct our prediction models.

Firstly, we will utilize historical fantasy scores as our target variable in one of our models. In the second model, we aim to predict each individual statistic that contributes to a fantasy player's total score. For instance, for wide receivers, this would involve predicting metrics like receiving yards, receptions, and touchdowns, and then multiplying these predictions by the corresponding points scale. Our third model will involve the development of a clustering model

to group similar players and defenses, enabling us to assess a player's performance against defenses of comparable quality.

For the regression models, we plan to employ Multiple Linear Regression, Lasso Regression, Ridge Regression, and stepwise regression to determine which model yields the most accurate predictions. In the case of the clustering model, our chosen methods will include K-means, K-nearest neighbors (KNN), and DBSCAN.

In addition to constructing our custom points prediction model for ongoing NFL seasons, we intend to create a user-friendly app tailored for fantasy football enthusiasts. This app will provide more precise predictions and in-depth analysis to enhance the fantasy football experience.

To support our points prediction efforts, we will leverage multiple datasets. One of the most significant sources will be NFLfastr, a play-by-play dataset spanning back to 1999. This dataset will empower us to analyze historical NFL game data comprehensively. Another valuable resource is Pro Football Focus, a website that assigns weekly grades to NFL teams. We will utilize the defensive grades from this source to enhance our predictions of offensive player performance. Lastly, we will extract fantasy point data dating back to the 2002 season from <https://fantasydata.com>, which will further enrich our dataset for modeling and analysis. We are also considering adding values to the table such as weather/temperature, winning/losing when point is earned, etc to gain a more holistic understanding of the scoring circumstances

Preliminary Results

We plan on initially comparing our models' performances to models used by ESPN, Yahoo, Sleeper, NFL, and CBS. These organizations predict the amount of points each player will earn in the upcoming season, which we'll compare to our predictions. We will also see how our model compares by position against these existing models.

Milestones and Deliverables

Date	Deliverable	Specifics
10/02/2023	Gather Data & Combine Datasets	Use base dataset (nflfastr) and add features we find important using alternative data sources
10/06/2023	EDA	Visualize player statistics (general plays and plays specifically important for Fantasy)
10/13/2023	Point Modeling & Creating Teams	Create a model that provides informed suggestions when creating teams. Suggestions will update in response to other people's team picks.
10/20/2023	Update Models Using Current Data	Use live data to make team decisions and update active roster based on current week's matchups
10/29/2023	Create Functional App	Create a web app to make project functional for users
10/31/2023	Add Design Components and Submit Final Report	Add any final details to webpage and complete final report as well as plan for next step

Risks

Our goal is to incorporate our models into a single coherent platform that allows the user a straightforward educational experience. Usability of an app or website is arguably as important to a user's experience as the content itself. Therefore it is imperative for us to ensure that the final application assists in the user's education. Our biggest risk is not being able to properly educate our audience or retain their interest, discouraging them from engaging with football.

Impact

Our hope is to create a platform that makes Fantasy Football more accessible to those who have limited experience with the topic. By broadening the target audience of Fantasy, we aim to create a more inclusive community and increase general interest and knowledge of the NFL.