Fantasy Premier League (FPL) Data Analysis

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1 Introduction

Fantasy Premier League (FPL) is an online game where participants build a team of real-life players to compete based on their actual performance in the Premier League. This project aims to fetch, analyze, and manipulate FPL data using Python, with the ultimate goal of optimizing team selection.

2 Data Fetching

The data for this project is fetched using the official FPL API. The following request was used to access the data:

```
url = 'https://fantasy.premierleague.com/api/bootstrap-static/'
r = requests.get(url)
json = r.json()
```

The API provides various data points, including player statistics, team information, and positions, which are loaded into Pandas DataFrames for analysis.

3 Data Preparation

Once the data is fetched, it is transformed into DataFrames for further manipulation. Three primary DataFrames are created:

- **elements_df**: Contains player information.

- **elements_types_df**: Contains player position types (e.g., goalkeeper, defender, midfielder, forward).

- **teams_df**: Contains team information.

The data is filtered to retain only relevant columns for analysis.

4 Data Analysis

The analysis focuses on optimizing FPL team selection. The relevant metrics such as player points, cost, and position are considered. The following steps are performed:

- Filtering players based on performance.

- Applying constraints for team selection (e.g., budget, number of players from each team).

- Running an optimization algorithm to select the best possible team.

5 Final Team Selection

The final selected team consists of 15 players: 11 starters and 4 substitutes. The positions are broken down as follows:

- **Goalkeepers**: 2 players.

- **Defenders**: 5 players.

- **Midfielders**: 5 players.

- **Forwards**: 3 players.

Table 1: Final Optimized FPL Team

Player Name	Position	Cost (£m)	Points
David Raya	Goalkeeper	5.5	135
Robert Sanchez	Goalkeeper	4.7	59
Trent Alexander-Arnold	Defender	7.7	122
Gabriel Magalhaes	Defender	6.2	149
Joel Veltman	Defender	4.5	49
Jan Paul van Hecke	Defender	4.5	61
Antonee Robinson	Defender	4.7	104
Cole Palmer	Midfielder	10.6	244
Bukayo Saka	Midfielder	10.1	226
Emile Smith Rowe	Midfielder	5.8	33
Bryan Mbeumo	Midfielder	7.3	127
Dwight McNeil	Midfielder	5.5	124
Nicholas Jackson	Forward	7.8	142
Danny Welbeck	Forward	5.8	79
Yoanne Wissa	Forward	6.0	131
Total		**96.2**	**119**

6 Results

The following graphs illustrate some of the metrics used for player selection. The graphs show the players that have outperformed and underperformed in terms of goals scored or assists provided
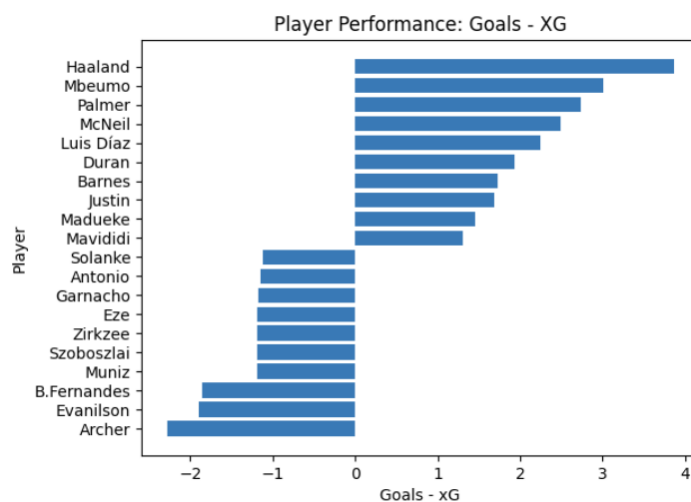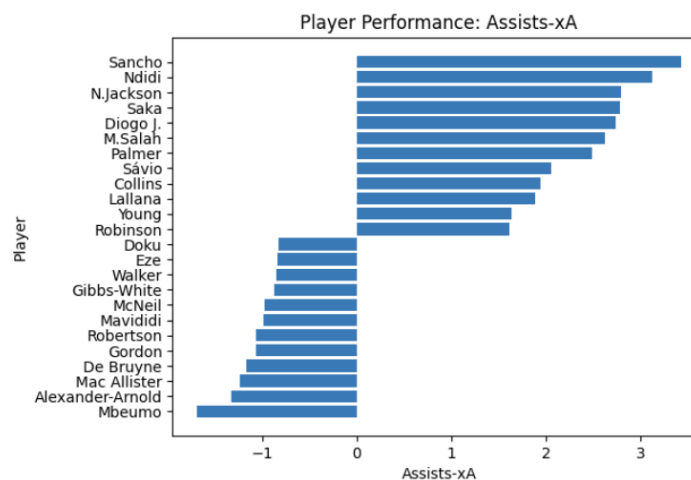

Figure 1: Goals - xG

Figure 2: Assists - xA

7   Conclusion

This project demonstrates the use of Python for fetching and analyzing data from the FPL API, leading to an optimized team selection. The selection process ensures adherence to constraints such as budget, number of players from each team, and positional requirements. Future work could explore advanced machine learning models for better performance prediction.

8   References

- Fantasy Premier League API: `https://fantasy.premierleague.com/api/bootstrap-static/`