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Fantasy Football Draft Project

Problem Introduction

While most people are familiar with professional sports, fantasy sports are an opportunity for fans to engage more directly through their own games. Perhaps the most popular fantasy sport is fantasy football, which follows players and teams in the National Football League (NFL). Fantasy football is the contest of selecting a roster of actual NFL players and competing against other fantasy teams. Players earn points based on their real-life statistics in NFL games. Each week, fantasy teams play head-to-head, and the winner is the team whose players have accumulated the most points.

The starting point of any league is the fantasy draft, which is a mechanism that allows the different fantasy teams to fairly select players. This happens once per year and allows each fantasy team to fill their roster, laying the foundation for their upcoming season. A typical league will feature a 16-round draft that comprises quarterbacks (QB), running backs (RB), wide receivers (WR), tight ends (TE), kickers (K), and defense/special teams (DST). Since these leagues are often highly competitive, teams are always looking for some competitive edge in order to gain an advantage over the other teams. A natural question becomes: is there an ideal way to fill a roster based on an initial draft position in order to maximize points earned over the year? I will investigate this issue for the 2025 fantasy football season.

Decision Variables

Since there is a 16-round draft and the player pool, the set S , is over 300 players, there are at least 4,800 decision variables:

$$x_{ij} = \begin{cases} 1, & \text{if player } j \text{ is selected in round } i \\ 0 & \text{otherwise} \end{cases} \quad \forall i = 1, \dots, 16, j \in S$$

Data

The key data elements that need to be gathered are:

- *Average Draft Position (ADP)*: Average pick that the player was taken in similar drafts.
- *General Player Information*: Eligible positions, NFL team, bye week.
- *Projections*: The projected point total for each player for the 2025 NFL season.

The majority of this information can be found on the [NFC website](#), which is a service that hosts high-stakes fantasy sports contests. There are numerous projection systems utilized to forecast player performance which are hosted by fantasy websites. Some potential resources are [Pro](#)

[Football Focus \(PFF\)](#), [Fantasy Pros](#), and [RotoWire](#). This is an open issue, and the best projection, or series of projections, will be determined through research.

Objective Function

Let p_j be the projected point total for player j . The objective function becomes:

$$\max \sum_{i=1}^{16} \sum_{j \in S} p_i * x_{ij}$$

Constraints

There are many constraints that need to be considered when modeling this problem. For the sake of space, their equations and inequalities will not be shown, but their intended effects are listed below:

- Binary decision variables
- Exactly one player will be selected per round
- A player can be selected only once, regardless of round
- A player cannot be selected after their ADP
- Snake draft enforcement: A fantasy team with the first pick in round 1 has the last pick in round 2, the first pick in round 3, and so on.
- The number of players with the same bye week (the week they do not have games) can be no greater than some integer $k > 0$ (still to be determined)
- The roster drafted must meet the following positional requirements:
 - 1 QB
 - 2 RB
 - 2 WR
 - 1 TE
 - 2 Flex (RB, WR, or TE)
 - 1 K
 - 1 DST
 - 6 bench spots (any player)

Concluding Thoughts

This is a special case of the assignment problem, a well-known problem in discrete optimization. It is very easy to obtain a solution to this problem; however, the issue becomes finding the best solution. The optimal solution will be the roster of 16 players that maximizes the projected point total for the 2025 NFL season. Since the NFL season kicked off in early September, there are real-time results that can be compared against the optimal fantasy team. If this proves to be an effective method, I hope to utilize this model as a tool when drafting my fantasy football team next year. I have investigated a similar model for fantasy baseball and had some success, so I know that it is feasible to model this problem as an integer program even with the large number of decision variables.