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UCLA MAS - Stats 418

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Daily Fantasy Football Optimizer

Background

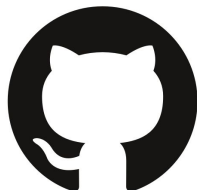


- Multi-million dollar industry where every week (or day) bettors compete against a pool of opponents to create the best fantasy lineup.
- Differs from regular season-long fantasy sports in which you draft a team at the beginning of the season and keep that roster for the entire season.
- Been the subject of court cases* over whether it is “gambling” vs. “game of skill”
- DraftKings, FanDuel, ESPN, Yahoo! - major players in the space with some prize pots for NFL competitions at over \$1M



* Source: [Wikipedia](https://en.wikipedia.org/wiki/Fantasy_sports)

The Dataset



nfscrapeR

- R package built on the NFL API play-by-play data
- Aggregated player stats from 2018 season
- Converted NFL stats to DraftKings [fantasy points](#)



RotoGuru

- Archive of daily fantasy salaries and points from variety of DFS sites
- Scraped using R's **rvest** package
- Joined with NFL stats dataset to get full 2018 fantasy season stats

The Optimizer

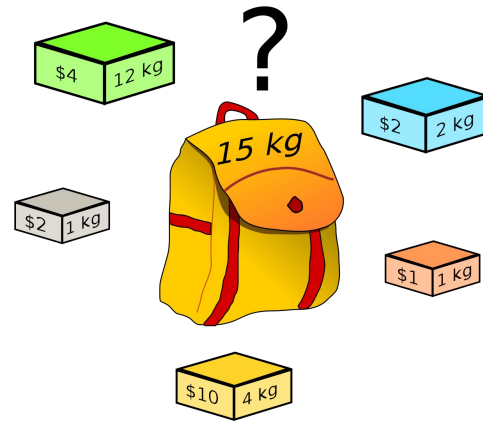


DraftKings Rules:

- 9 player lineups (1 QB, 3 WRs, 2 RBs, 1 TE, 1 Flex*, 1 DEF)
- \$50,000 maximum salary

Linear Optimization

- Using R's `lpSolve` package
- Essentially an iteration of the [Knapsack Problem](#)
- Outputs optimal lineup based on most fantasy points within salary budget constraint



The App



[Link to the Shiny Dashboard](#)

Daily Fantasy Optimizer

Optimizer

Explore

Data

About

NFL 2018 Season

Choose NFL Week Number:

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

Optimize

Optimized Lineup

Week	DOW	Player	Pos	Team	Opp	Salary	Fantasy Pts
3	Sun	D.Brees	QB	NO	ATL	6400	43.54
3	Sun	C.Ridley	WR	ATL	NO	3700	43.50
3	Sun	T.Boyd	WR	CIN	CAR	3700	28.70
3	Sun	R.Woods	WR	LA	LAC	5100	36.70
3	Sun	J.Nelson	WR	OAK	MIA	4400	32.30
3	Sun	T.Gurley	RB	LA	LAC	9200	28.60
3	Sun	A.Kamara	RB	NO	ATL	9500	37.00
3	Mon	V.McDonald	TE	PIT	TB	3000	24.20
3	Sun	Buffalo	Def	BUF	MIN	2000	17.00

\$47,000

total DraftKings salary

291.54

total Fantasy Points

Next Steps



Utilize Projections

Aggregate fantasy projection sites (ESPN, CBS, FantasyPros, etc.)



Supplemental Data

Scrape weekly salaries, injury updates, weather forecasts



Multiple Lineups

Generate multiple iterations of top lineups for hedging



Build Own Model

Using publicly available projections limits differentiation from competitors