Fantasy Football Lineup Optimizer

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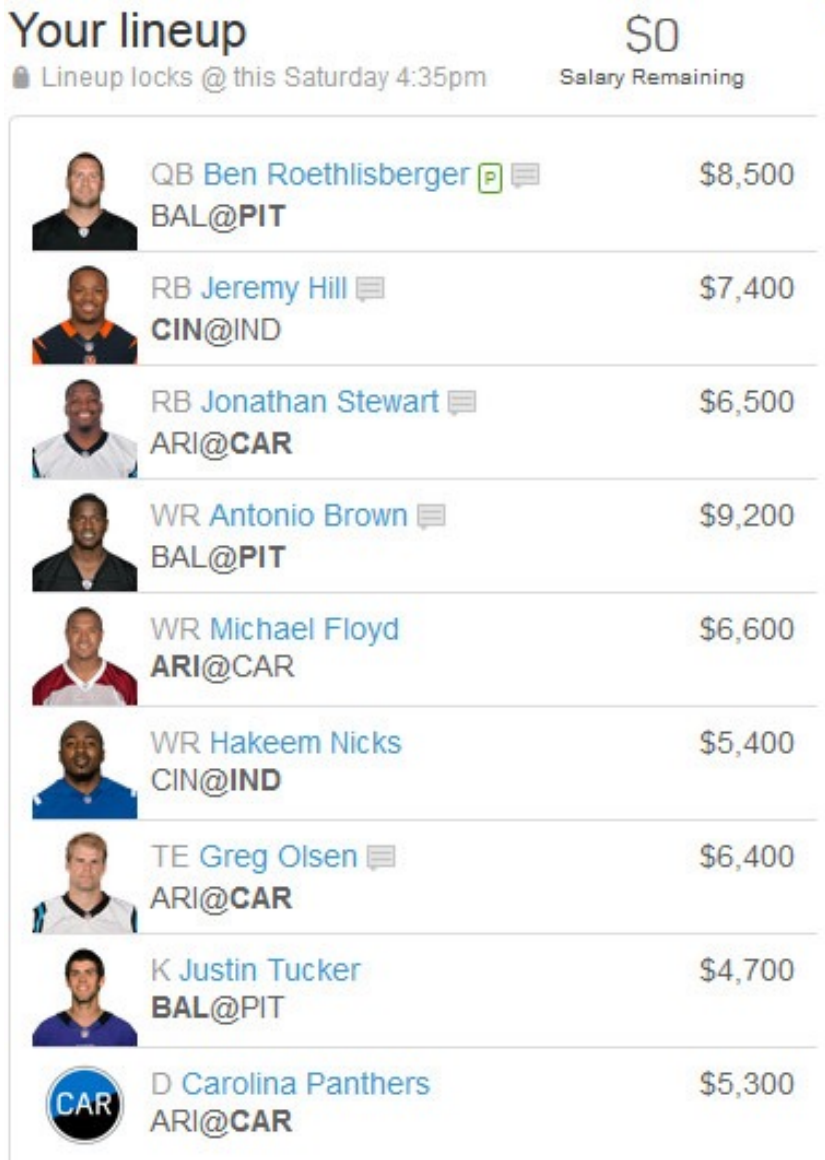
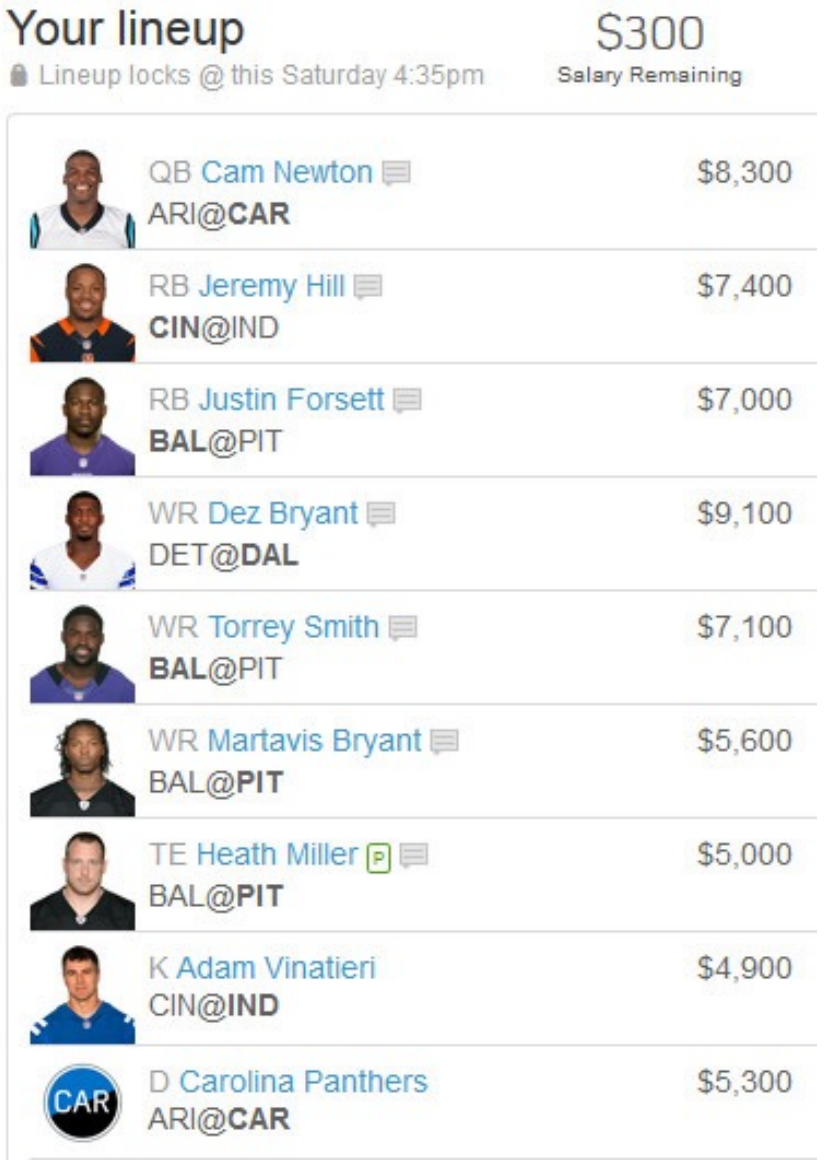
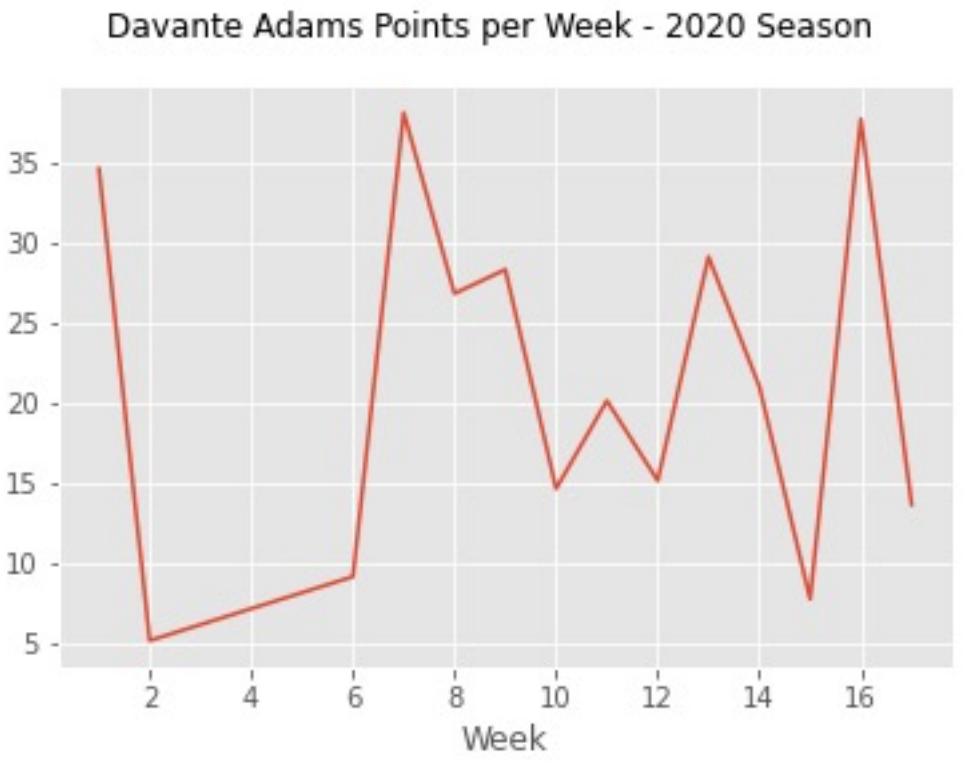
Intro/Recap


Your lineup
Lineup locks @ this Saturday 4:35pm
$0
Salary Remaining
QB Ben Roethlisberger P
BAL@PIT
$8,500
RB Jeremy Hill
CIN@IND
$7,400
RB Jonathan Stewart
ARI@CAR
$6,500
WR Antonio Brown
BAL@PIT
$9,200
WR Michael Floyd
ARI@CAR
$6,600
WR Hakeem Nicks
CIN@IND
$5,400
TE Greg Olsen
ARI@CAR
$6,400
K Justin Tucker
BAL@PIT
$4,700
D Carolina Panthers
ARI@CAR
$5,300


Your lineup
Lineup locks @ this Saturday 4:35pm
$300
Salary Remaining
QB Cam Newton
ARI@CAR
$8,300
RB Jeremy Hill
CIN@IND
$7,400
RB Justin Forsett
BAL@PIT
$7,000
WR Dez Bryant
DET@DAL
$9,100
WR Torrey Smith
BAL@PIT
$7,100
WR Martavis Bryant
BAL@PIT
$5,600
TE Heath Miller P
BAL@PIT
$5,000
K Adam Vinatieri
CIN@IND
$4,900
D Carolina Panthers
ARI@CAR
$5,300

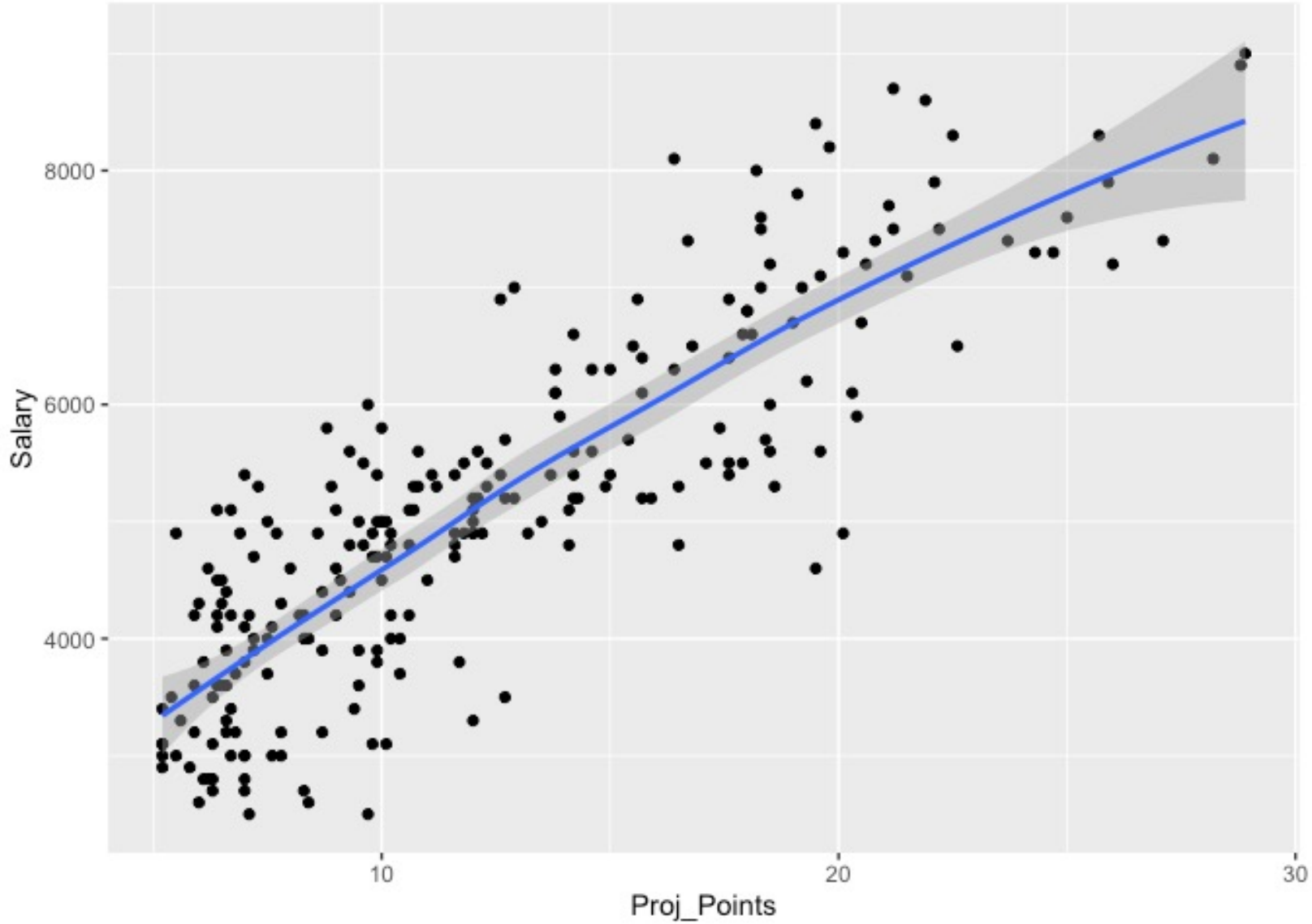
Project 1 Overview

Name	Pos	FanDuel Salary	Cumulative Points	Games Played	Average Points (Projection for Future Performance)	Cost per Point	Value Rank
Brown, Marquise	WR	$6,800	89.6	5	17.92	$379.46	1
Williams, Mike	WR	$7,700	100.6	5	20.12	$382.70	2
Samuel, Deebo	WR	$7,700	94.5	5	18.9	$407.41	3
Kupp, Cooper	WR	$8,400	100.3	5	20.06	$418.74	4
Chase, Ja'Marr	WR	$7,300	86.9	5	17.38	$420.02	5
Brown, Antonio	WR	$6,500	61.1	4	15.275	$425.53	6
Hill, Tyreek	WR	$8,500	96.6	5	19.32	$439.96	7
Evans, Mike	WR	$7,000	77.8	5	15.56	$449.87	8
Adams, Davante	WR	$8,200	90.9	5	18.18	$451.05	9
Metcalf, D.K.	WR	$7,400	80.8	5	16.16	$457.92	10



New Data – DraftKings Projections & Salaries for upcoming contests

Note: Correlation between salary and actual points = 0.58



Linear Equation : y = 171.7x +3037.4
R^2 = 0.67
Residual Standard Error = 752.3

Possible Lineup Combinations

- C = n! / ((n-r)! * r!)
  - C = combination
  - n = number of items
  - r = items to select
- QB: n = 32, r = 1
- RB: n = 64, r = 2
- WR: n = 96, r = 3
- TE: n = 32, r = 1
- K: n = 32, r = 1
- DEF: n = 32, r =1
- 32 * 2,016 * 142,880 * 32 * 32 * 32 = **302 Trillion Lineups**

Random Walk

- Create script to randomly generate lineups fitting the position and salary requirements
- Inputs:
  - Table of players with positions, salaries, and project points
  - Number of lineups to simulate
- Sort lineups by total projected team points
- Output:
  - Top n lineups

Knapsack Problem

- Given a set of items, each with a weight and a value, determine the number of each item to include in a collection so that the total weight is less than or equal to a given limit and the total value is as large as possible.
- Linear programming is a technique for the optimization of linear objective function, subject to linear equality and linear inequality constraints
- R Library “lpSolve”

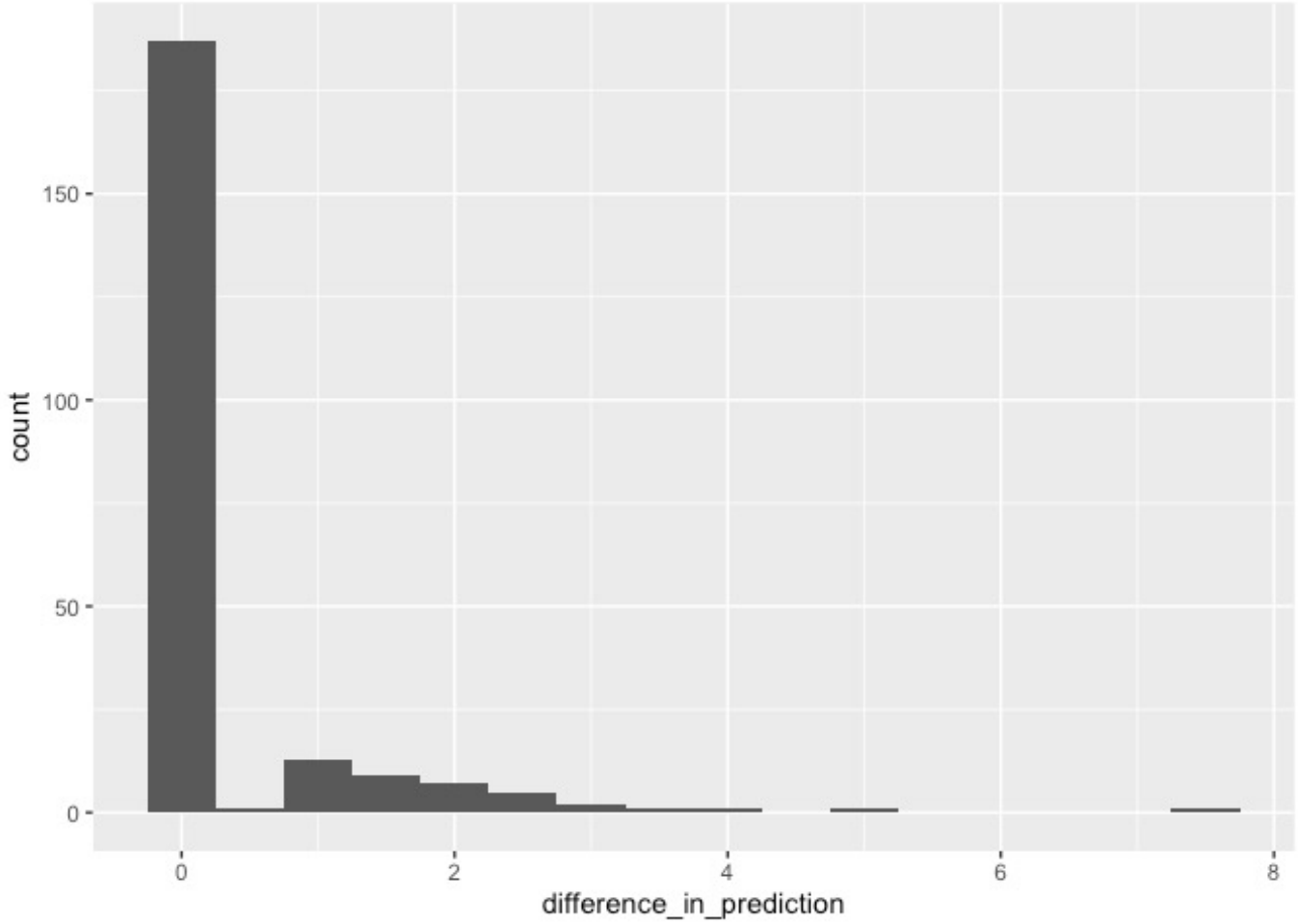
App Demo

Compare Results

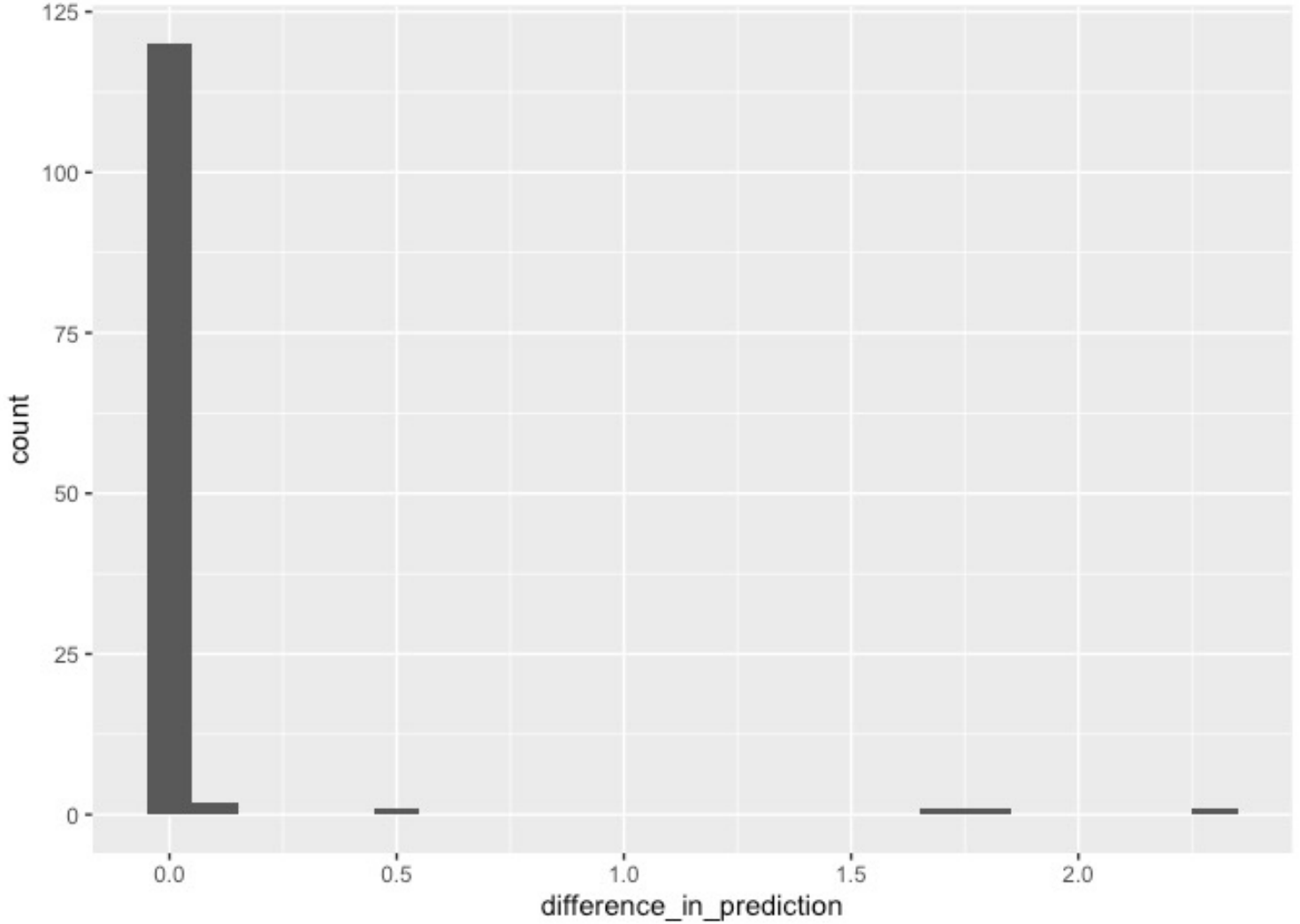
- *Average points in contest*: **127**
- *Average in the money score*: **157**
- *Average top score:* **197**

Source: rotogrinders.com

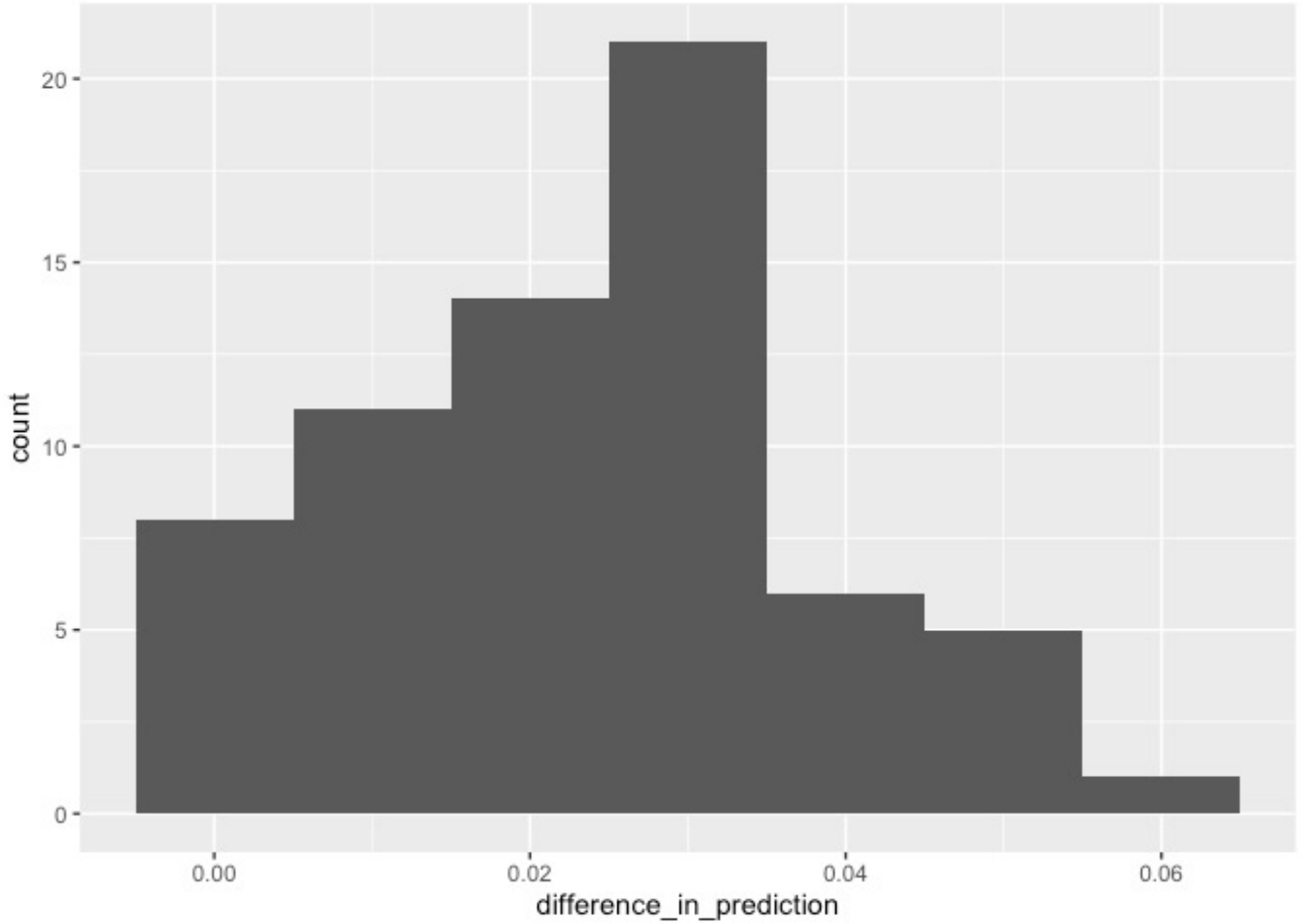
Histogram of Difference in Projection (Filter out players with projected points < 5)



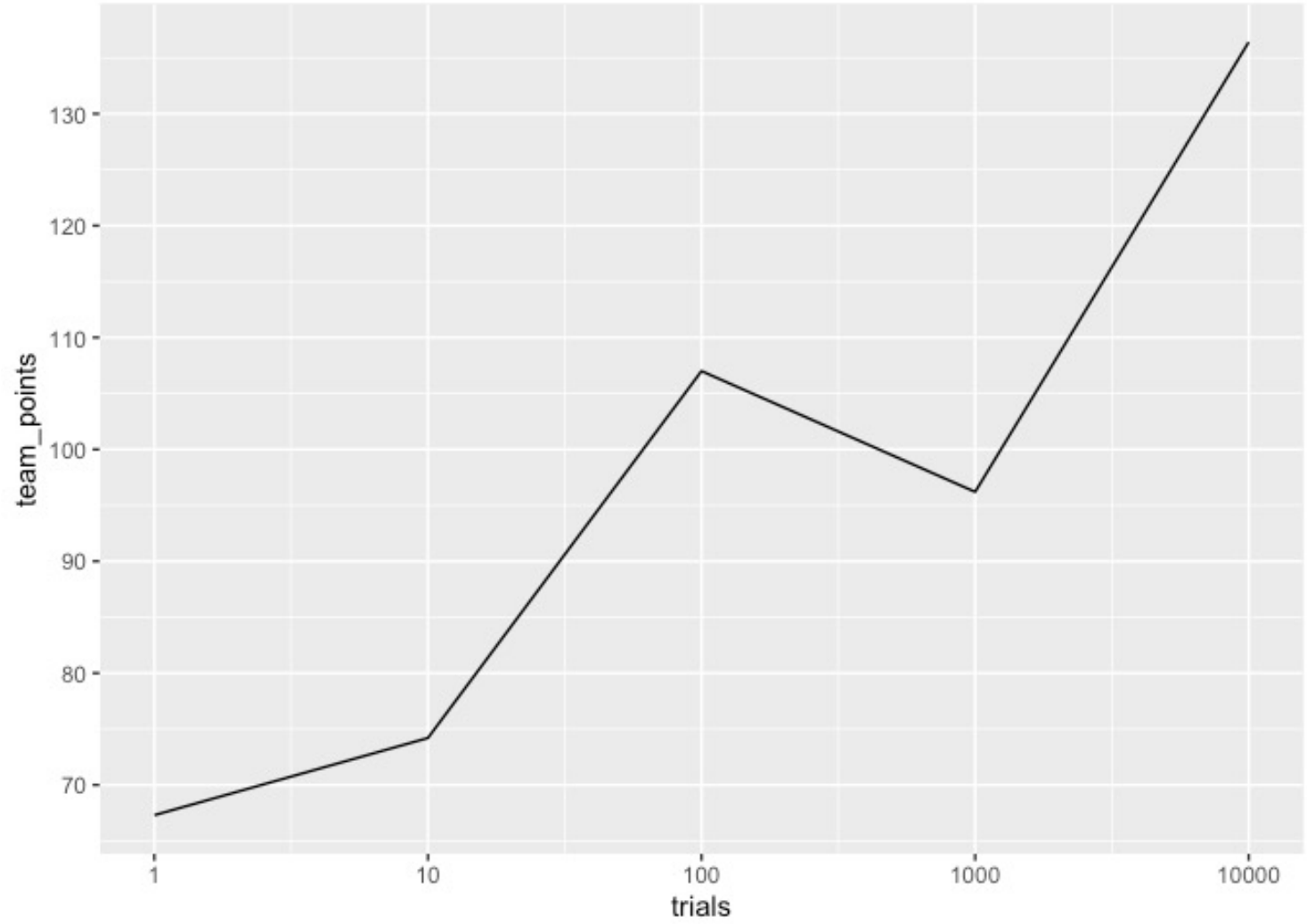
Histogram of Difference in Projection (Filter out players with projected points < 10)



Histogram of Difference in Projection (Filter out players with projected points <15)

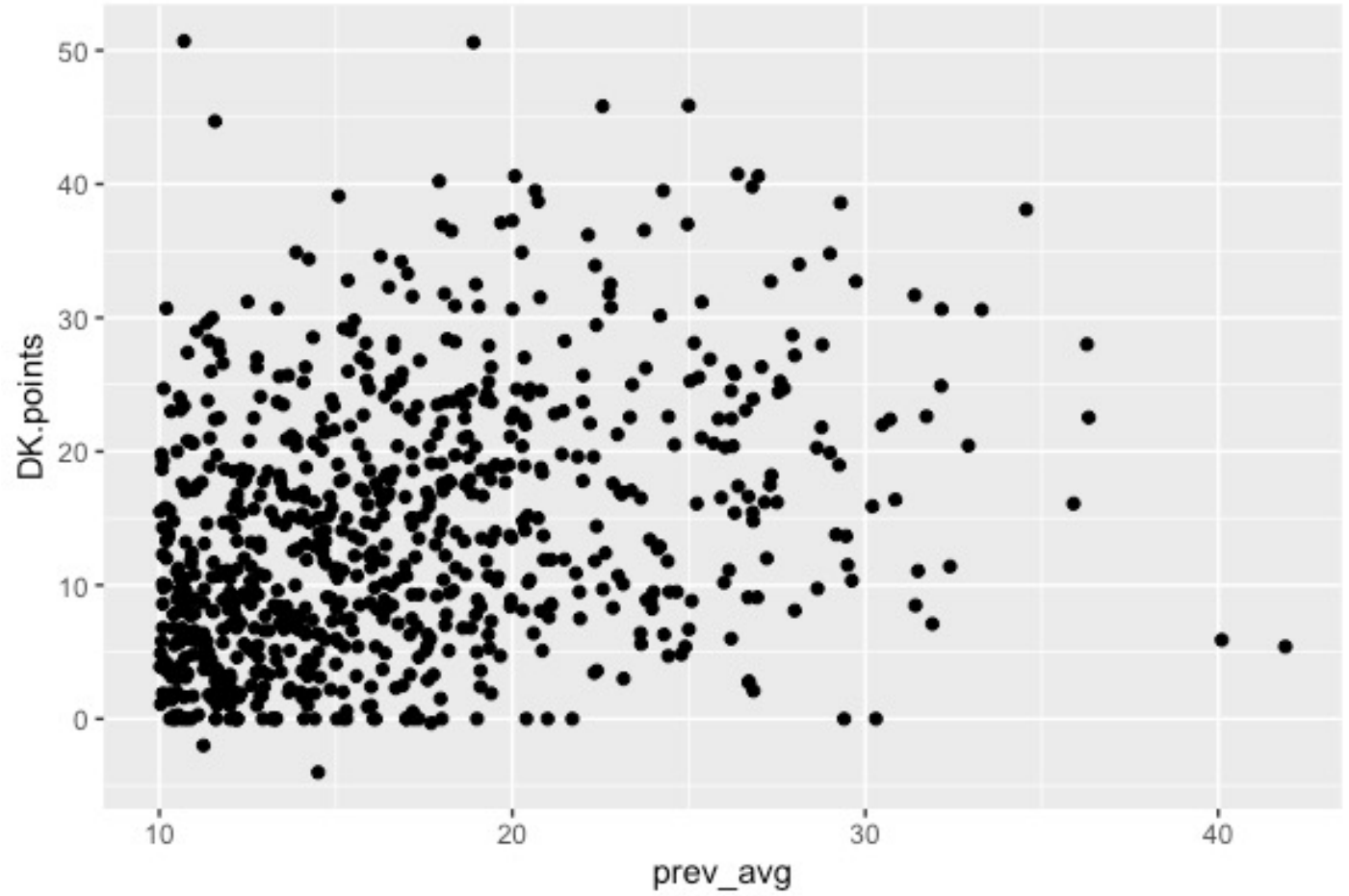


Improvement in Random Walk as #trials increase

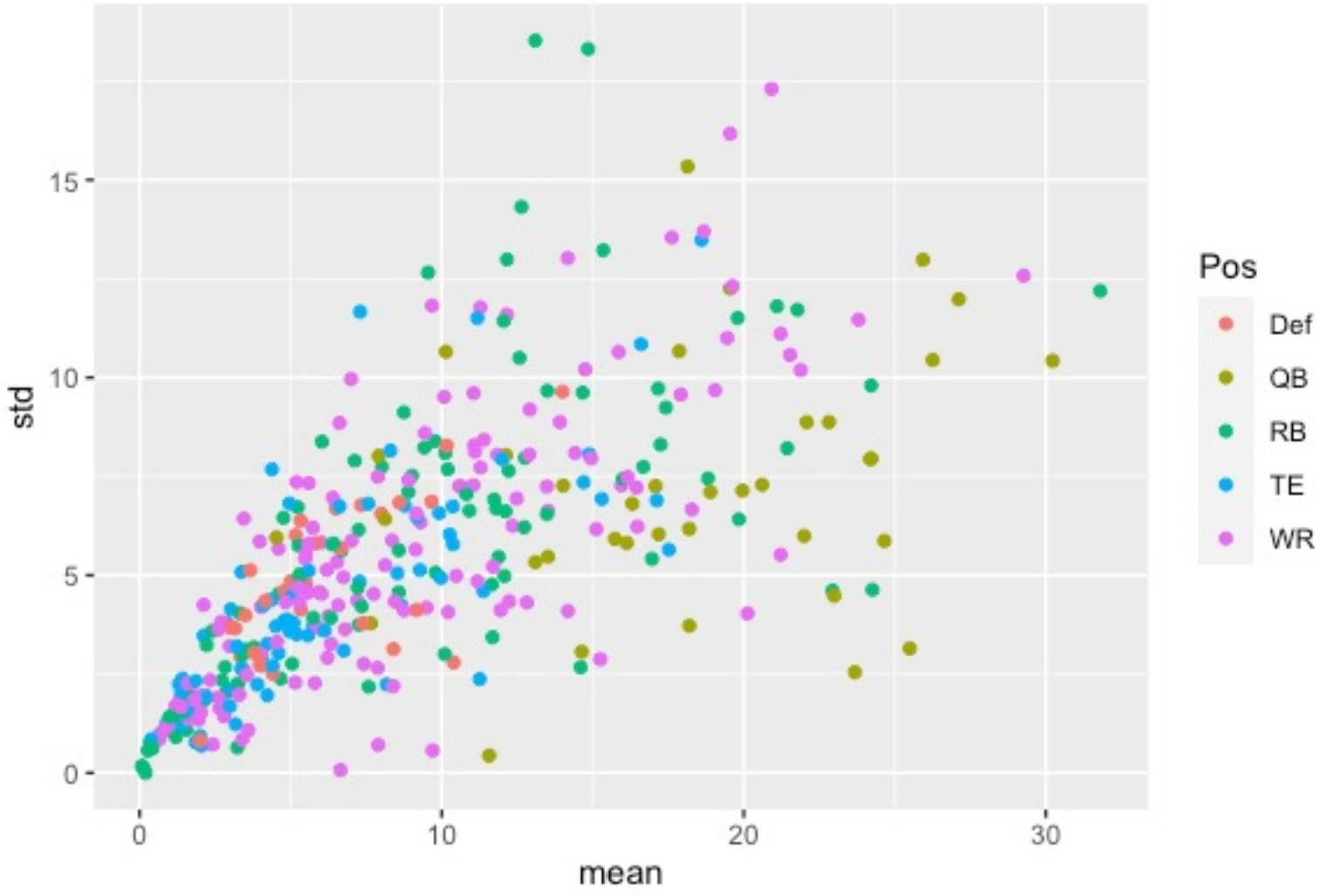


LP Solver solution: 174

Prev. Week Projection vs. Actual Points



Average Points for Player vs. Standard Deviation



Conclusions & Next Steps

- Include player standard deviation as constraint in LP Solver function
- Experiment with other online fantasy points projection websites
- Incorporate actual game statistics and create model to output more accurate predictions than running average method
- Add NBA tab to app, other sports?