Predicting Fantasy Football Points using Regression Analysis

Study completed by Ridwan Alam

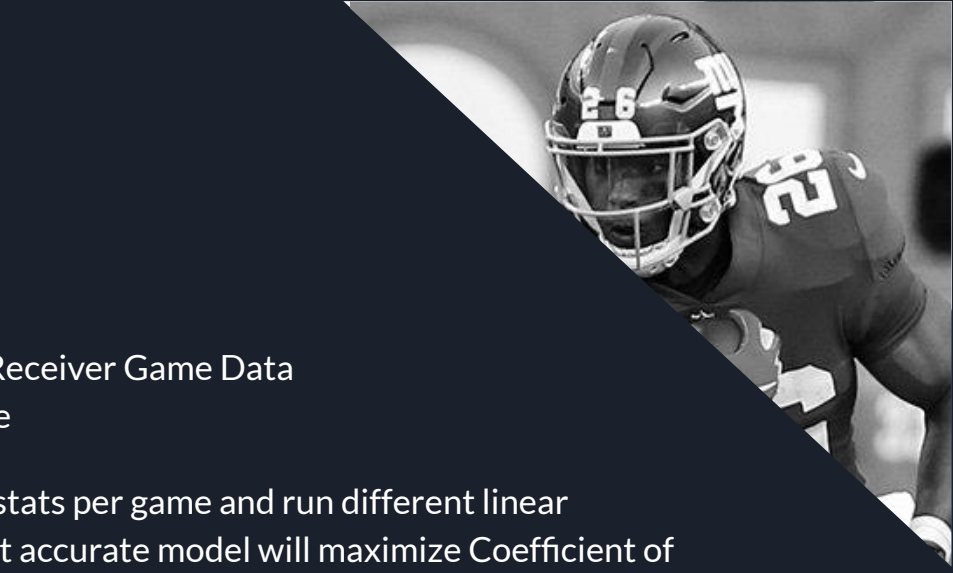
Project Objective & Target Audience

Develop an optimal model using a Linear, Polynomial, Lasso, and Ridge regressions to predict the future fantasy points' outcome in a subsequent game for a Running Back or Wide Receiver in the National Football League (NFL).

Target Audience

- Fantasy Football players
- NFL statistics enthusiasts

Data



Data Source

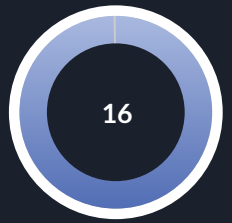
2019 Running Back and Wide Receiver Game Data
Source: Pro-Football-Reference

Data Analysis

Organize data based off player stats per game and run different linear regression techniques. The most accurate model will maximize Coefficient of Determination (R^2) and minimize Root Mean Square Error (RMSE).

Running Backs

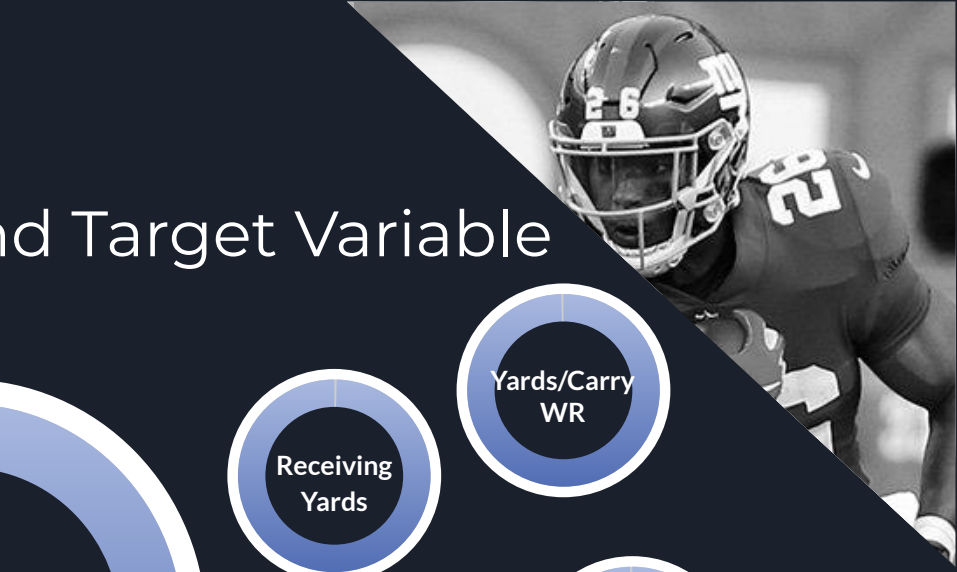
Wide Receivers



Games per Player
Unless injured

Rows of Data

Potential Features and Target Variable



Carries

Rushing Touchdowns

Fantasy Points

Receiving Yards

Yards/Carry WR

Rushing Touchdowns

Receiving TDs WR

Rushing Yards

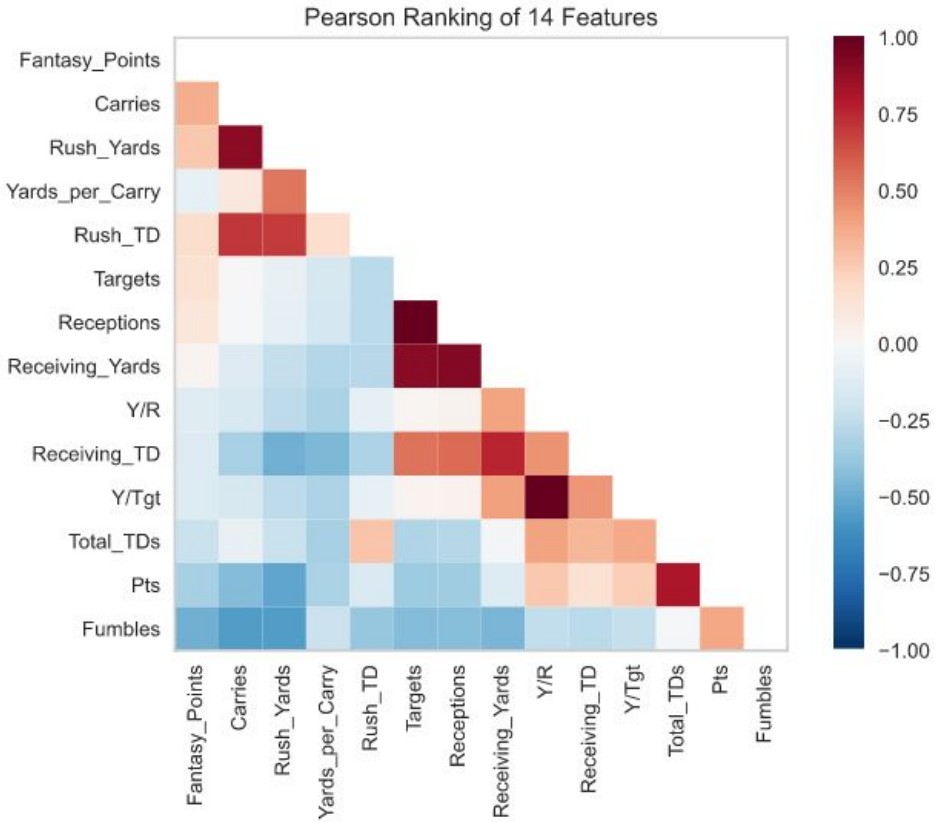
Targets

Receptions

Fumbles

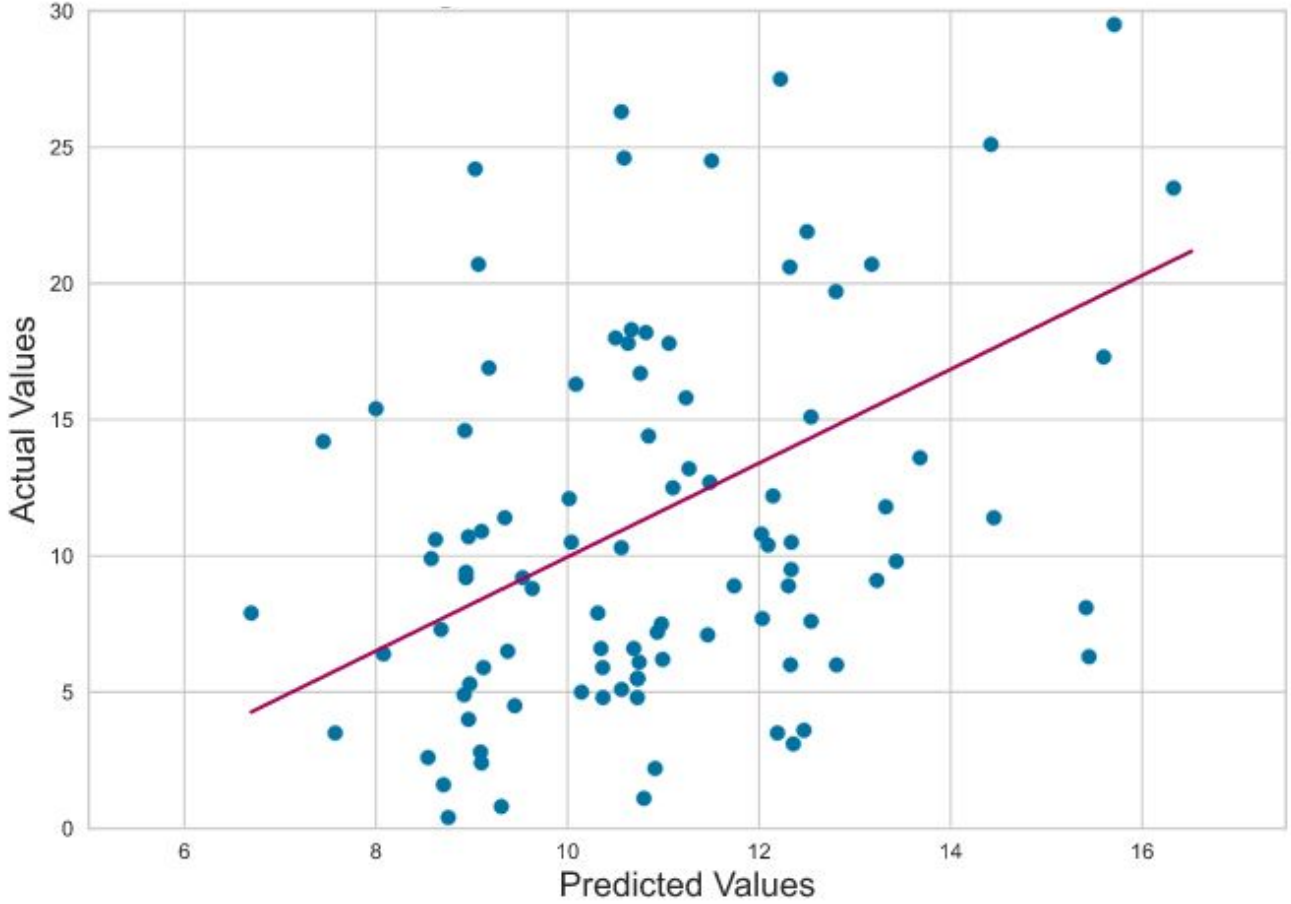
Receiving Yards/Target

Features Correlation Heatmap

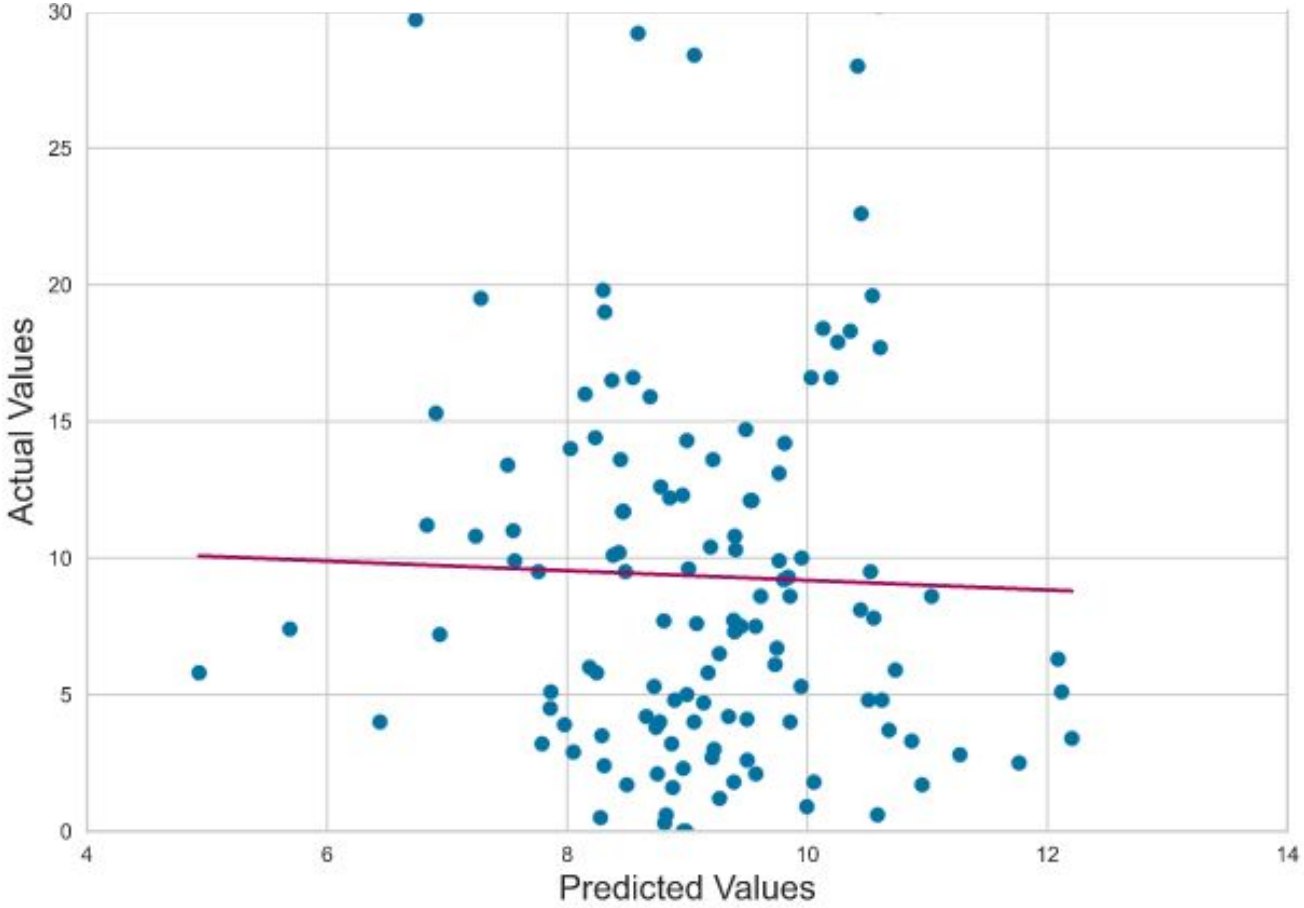


Linear Regression

Running Backs: Actual vs. Predicted



Wide Receivers: Actual vs. Predicted



Predicted vs. Actual Comparison: Running Backs

Name	Tested Fantasy Points	Predicted Fantasy Points	Delta
Derrick Henry	10.8	15.60	4.80
Derrick Henry	39.1	11.24	27.86
Ezekiel Elliott	18	11.06	6.94
Ezekiel Elliott	10.5	12.15	1.65
Nick Chubb	36.3	11.74	24.56
Nick Chubb	9.8	10.04	0.24
Christian McCaffrey	23.5	10.75	12.75
Christian McCaffrey	29.5	9.35	20.15

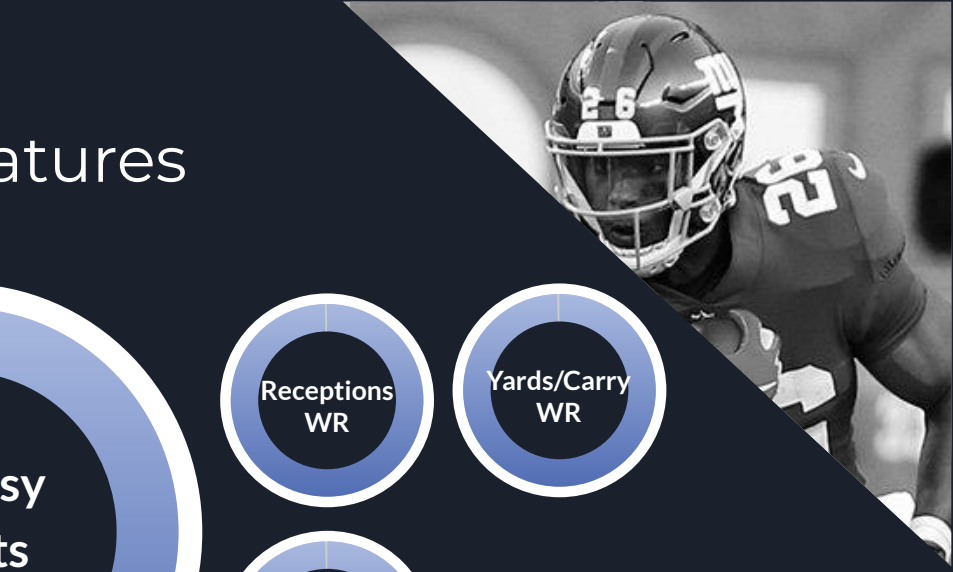
Average	
Tested Fantasy Points	19.71
Predicted Fantasy Points	10.78
Delta	8.93

Predicted vs. Actual Comparison: Wide Receivers

Name	Tested Fantasy Points	Predicted Fantasy Points	Delta
Michael Thomas	30.2	9.27	20.93
Michael Thomas	4.8	10.68	5.88
Keenan Allen	30.6	9.61	20.99
Keenan Allen	8.6	9.06	0.46
DeAndre Hopkins	4	11.76	7.76
DeAndre Hopkins	7.5	8.31	0.81
Julian Edelman	3	10.60	7.60
Julian Edelman	9.9	10.25	0.35

Average	
Tested Fantasy Points	10.57
Predicted Fantasy Points	9.25
Delta	1.32

Final Features



Rushing TDs RB

Carries RB

Fantasy Points

Receptions WR

Yards/Carry WR

Rushing Yards

Receiving TDs WR

Targets

Receiving Yards/Target

Receiving Yards

Conclusion

Removed several features to reduce the RSME (+/- amount of points model is accurate to)

Running Back: RSME = 7.57 points

Wide Receiver: RSME = 6.76 points

Future Iterations

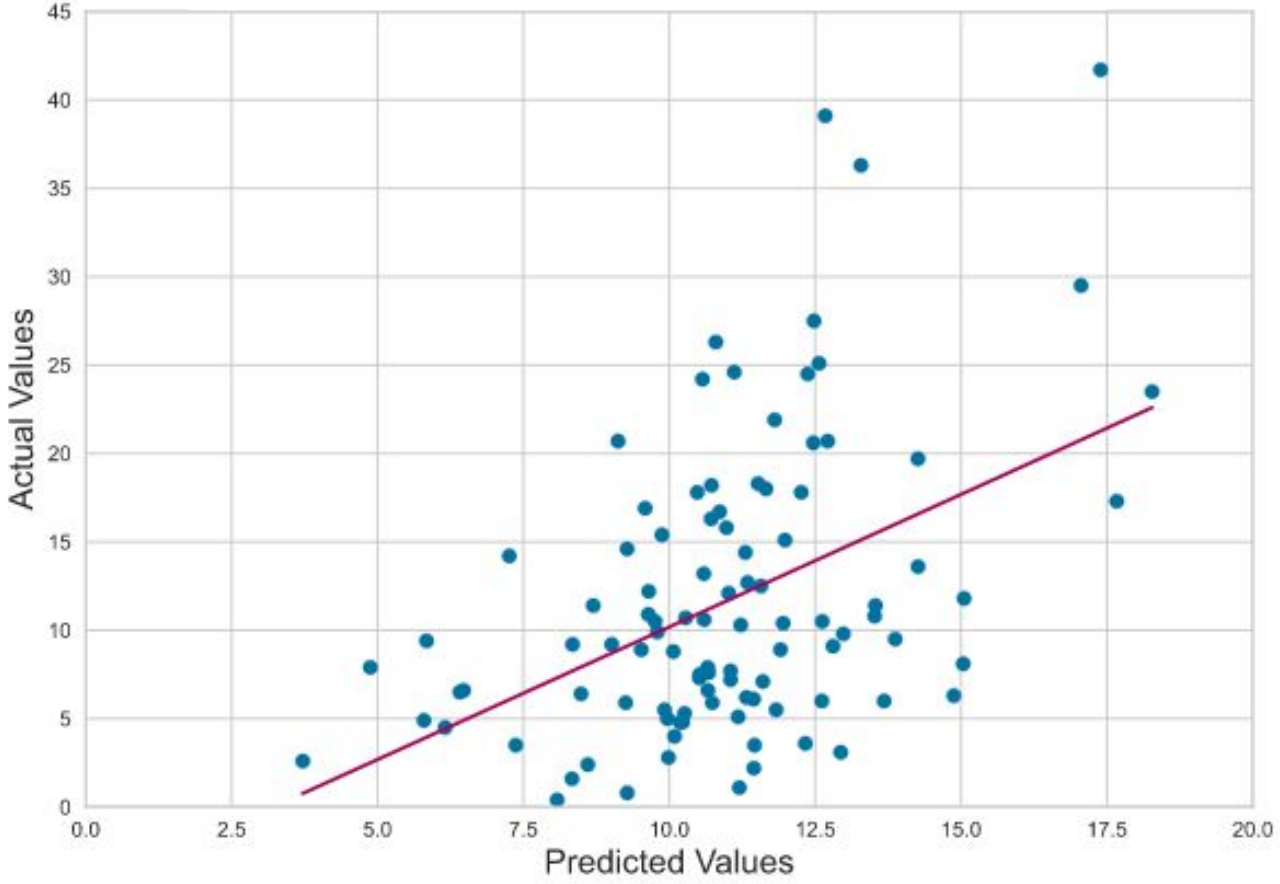
4-week running average

Incorporate Defense's statistics

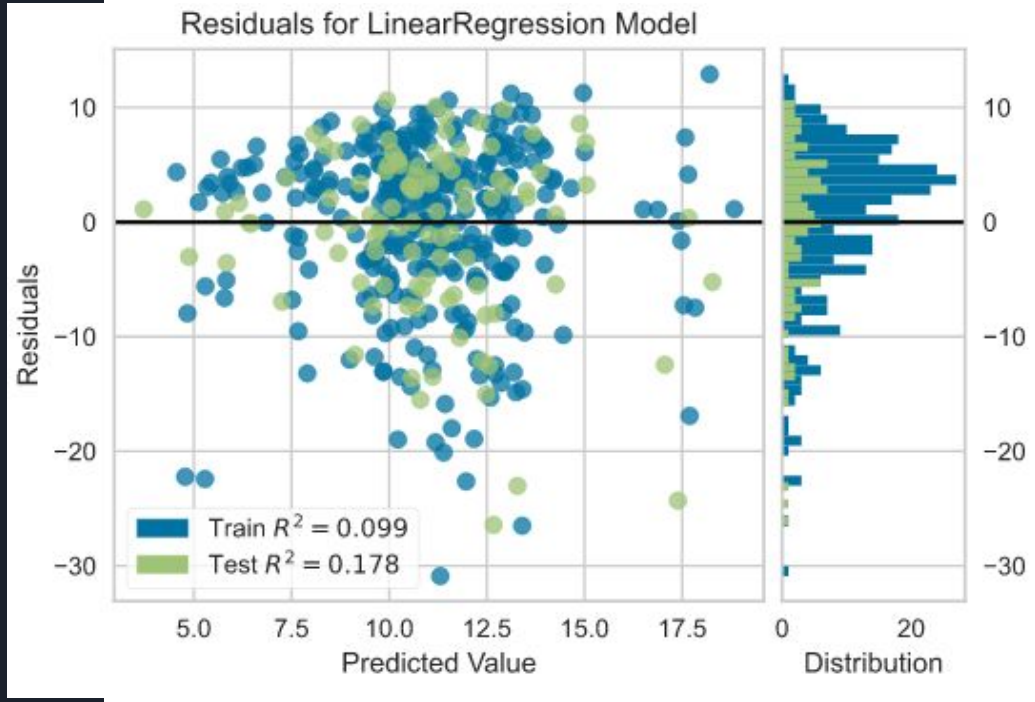
Compare to other linear regression models by Yahoo, ESPN, and etc.

Questions?

Linear Regression



Residuals


Residuals for LinearRegression Model
Residuals
Predicted Value
Distribution
Train $R^2 = 0.099$
Test $R^2 = 0.178$
10
0
−10
−20
−30
5.0
7.5
10.0
12.5
15.0
17.5
0
20