NFL Rankings/Playoffs Predictions

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Overview – Created dependent variable 'OVR RANK'
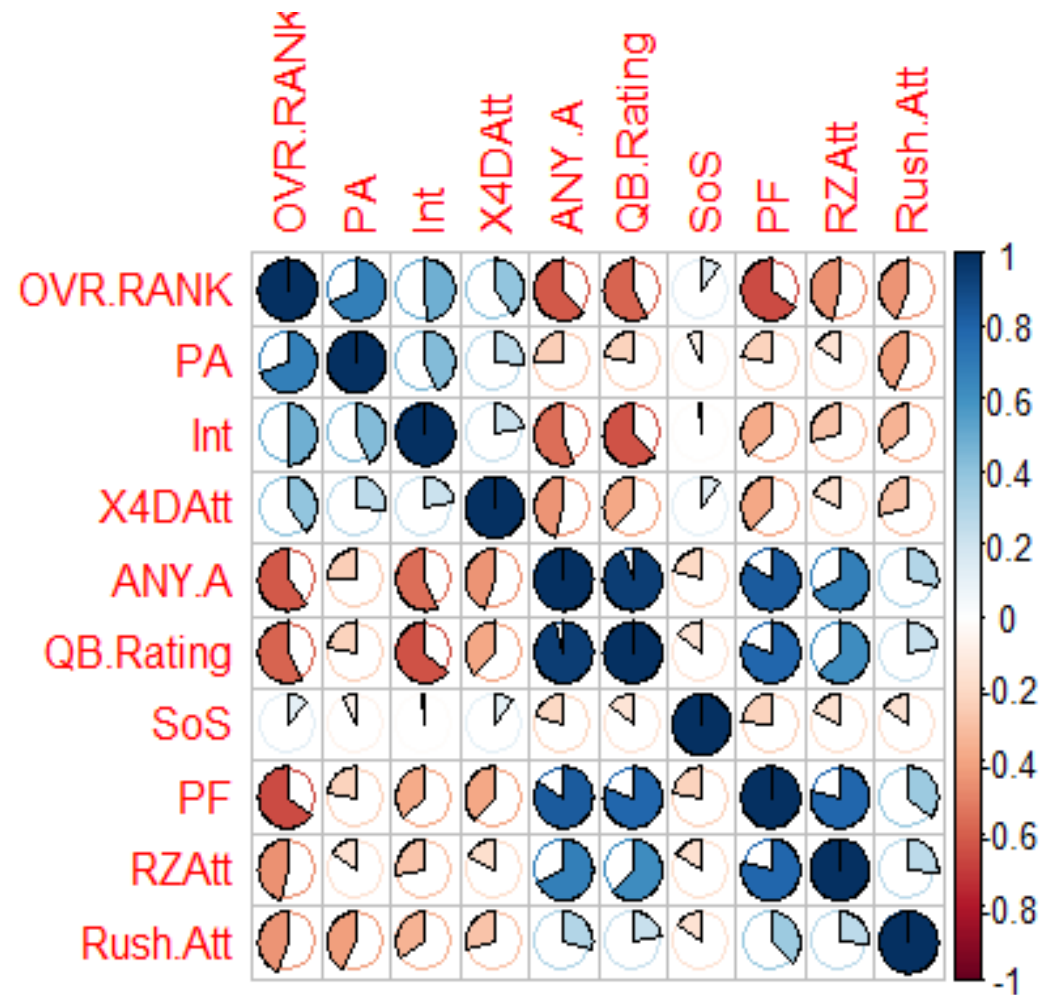
▶ Primary goal was to use historical data to predict 2017 rankings

  ▶ Top 6 in each conference make the playoffs every year

▶ Utilized historical team rankings based on 2014, 2015, and 2016

  ▶ Separated through NFC and AFC Conferences

▶ Rankings were sourced from playoff seedings

  ▶ Reg season ranking was used for teams that did not make the playoffs
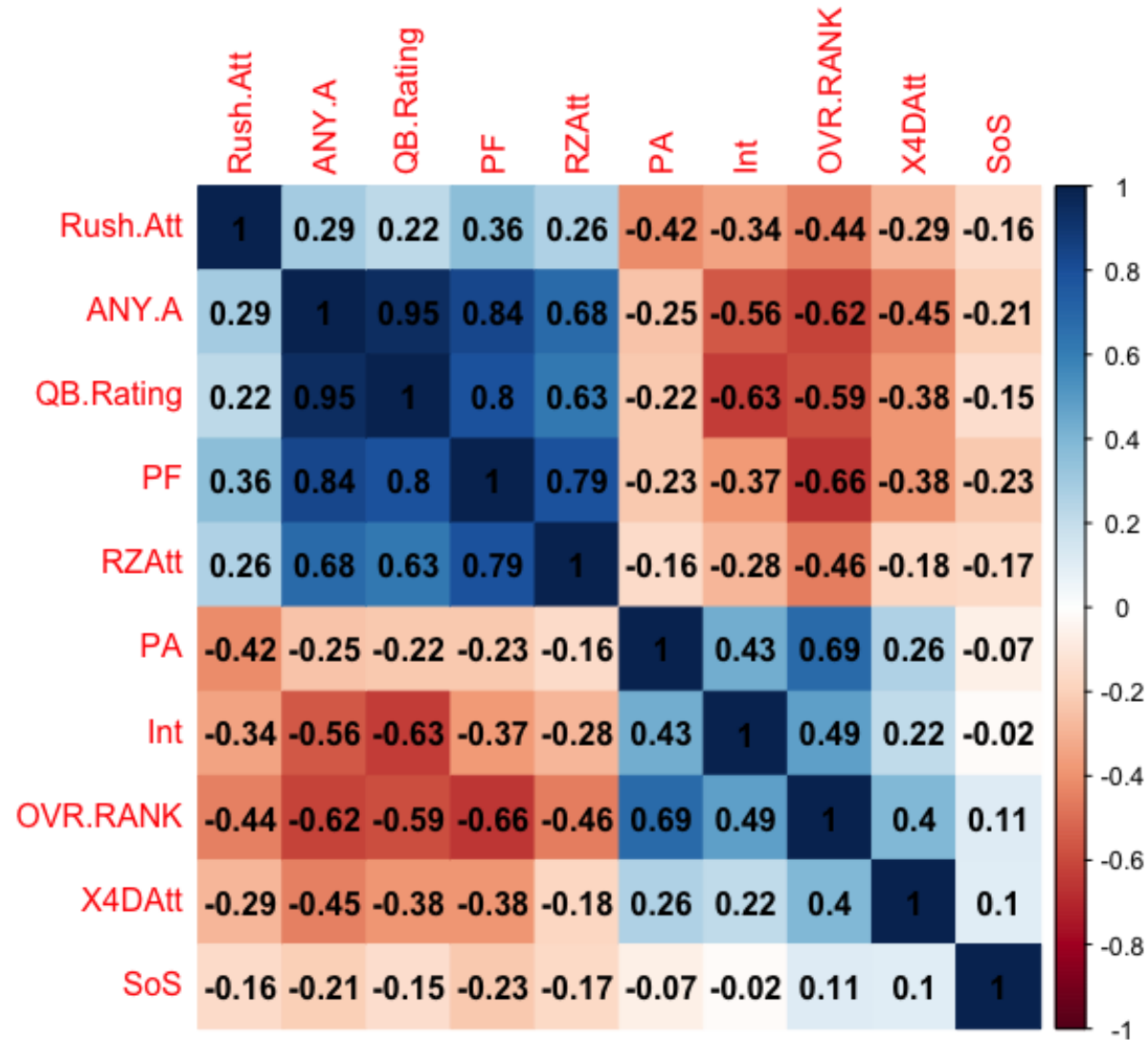
Key Variables Definitions

- ▶ PA: Total Points Against/Allowed

- ▶ PF: Total Points For/Scored

- ▶ Int: Total Interceptions

- ▶ X4DATT: 4th Down Attempts per game

- ▶ ANY.A: Adjusted Net Yards per Pass Attempt

- ▶ QB Rating: Average QB Rating (determined by NFL)

- ▶ SoS: Strength of Schedule

- ▶ RZAtt: Red Zone Attempts (close to scoring)
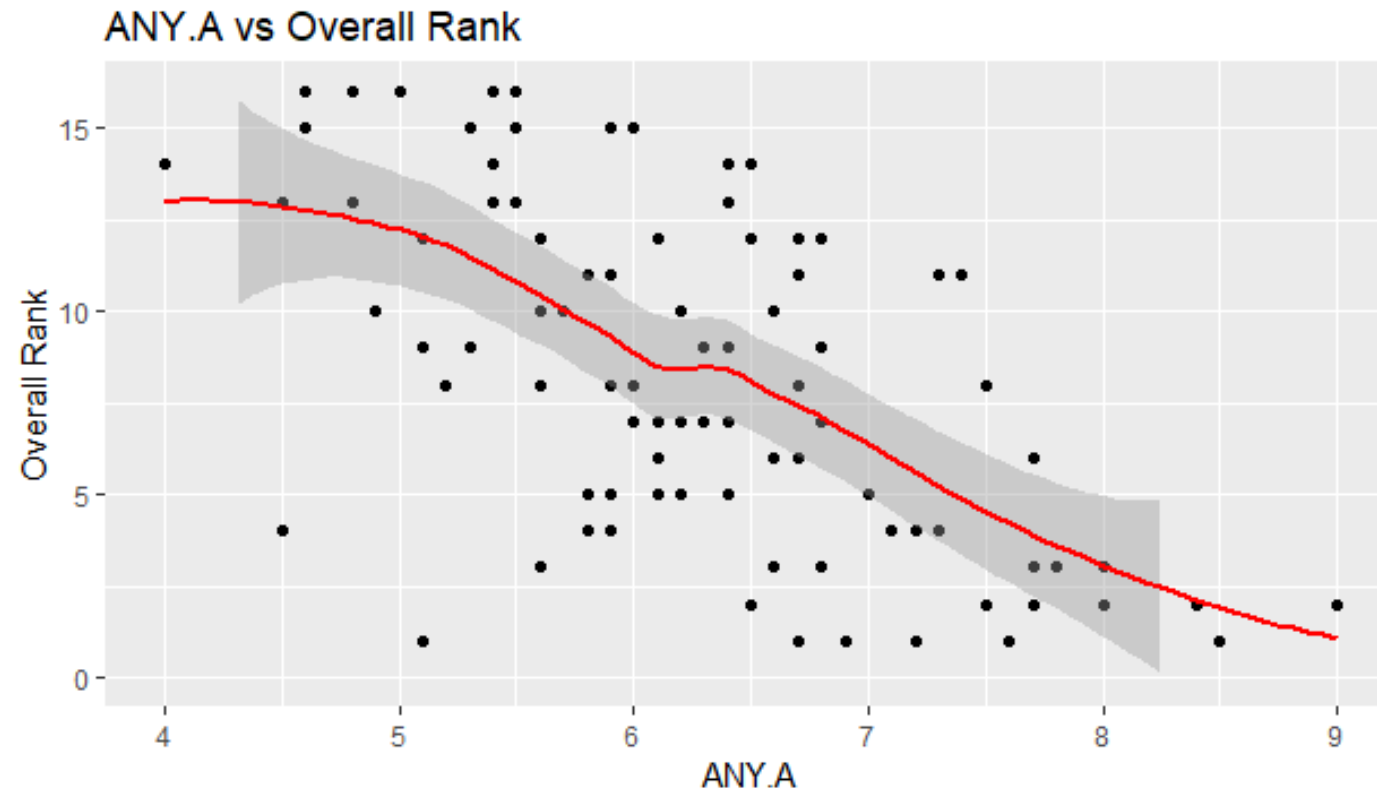
- ▶ Rush Att: Total Running Attempts by team
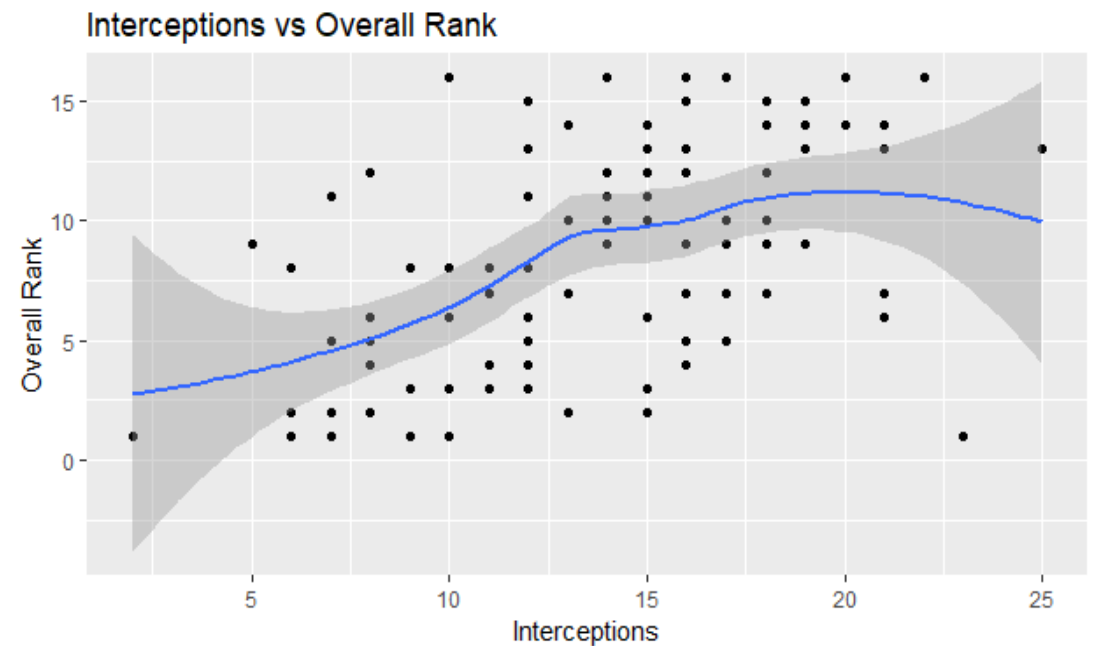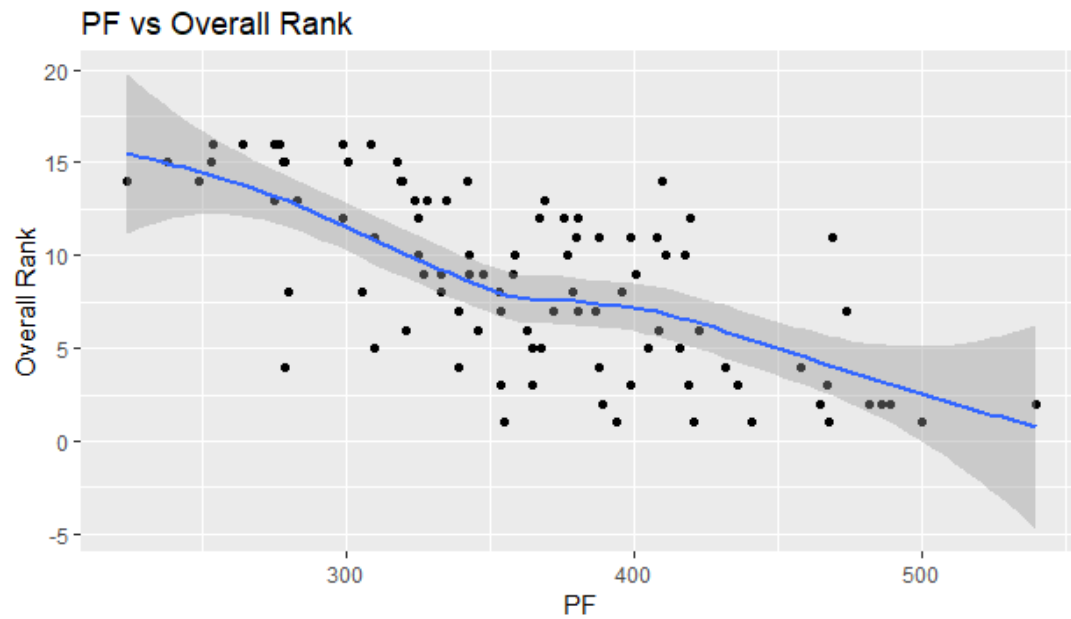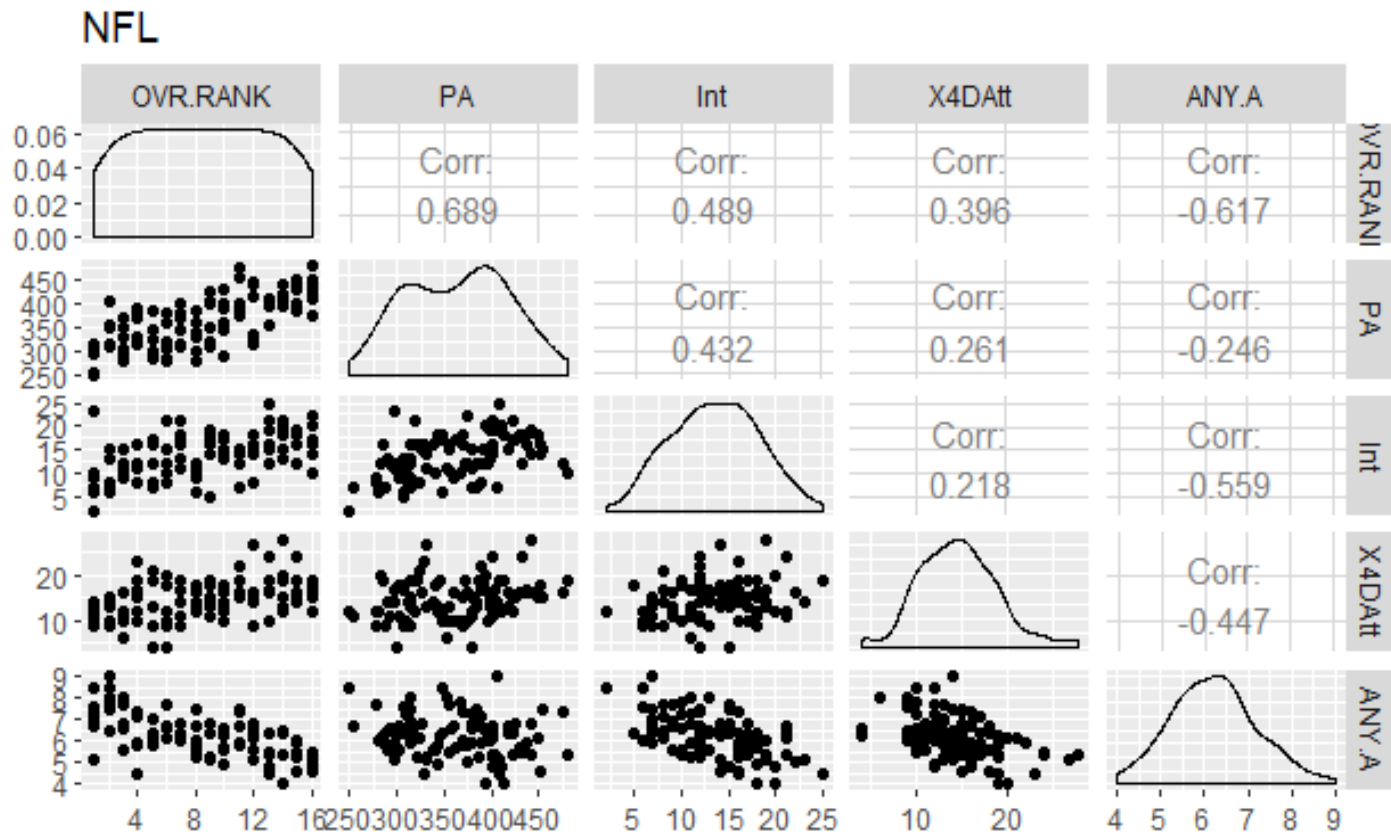
Correlation Studies

Correlation *(continued)*

Relationships Between Predictors & OVR RANK

ANY.A vs Overall Rank

Relationships Between Predictors & OVR RANK

GGPairs/Correlation

Linear Model

► lm(OVR.RANK ~ PA + Int + tot.FL + SoS + X4DAtt + PF + ANY.A + QB.Rating + RZAtt + Rush.Att, data = nflnum)

```
Call:
lm(formula = OVR.RANK ~ PA + Int + tot.FL + SoS + X4DAtt + PF +
    ANY.A + QB.Rating + RZAtt + Rush.Att, data = nflnum)

Residuals:
    Min      1Q  Median      3Q     Max
-6.3562 -1.7256 -0.1774  1.8551  4.8022

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  4.507944   6.389917   0.705 0.482442
PA           0.044648   0.005776   7.729 1.98e-11 ***
Int          0.025183   0.085432   0.295 0.768887
tot.FL       0.117958   0.090679   1.301 0.196835
SoS          0.095095   0.147146   0.646 0.519851
X4DAtt       0.029648   0.067385   0.440 0.661062
PF          -0.036075   0.009182  -3.929 0.000173 ***
ANY.A       -0.148823   0.914265  -0.163 0.871079
QB.Rating   -0.027200   0.091537  -0.297 0.767083
RZAtt        0.063288   0.050228   1.260 0.211113
Rush.Att    -0.002016   0.006659  -0.303 0.762863
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.403 on 85 degrees of freedom
Multiple R-squared:  0.7595,    Adjusted R-squared:  0.7312
F-statistic: 26.84 on 10 and 85 DF,  p-value: < 2.2e-16
```

Predictions vs Actual – Linear

Tm	2017 Predictions	Tm	2017 Actual
New England Patriots	1	**New England Patriots**	1
Minnesota Vikings	1	**Philadelphia Eagles**	1
Jacksonville Jaguars	2	**Minnesota Vikings**	2
Philadelphia Eagles	2	**Pittsburgh Steelers**	2
Los Angeles Chargers	3	**Jacksonville Jaguars**	3
New Orleans Saints	3	**Los Angeles Rams**	3
Los Angeles Rams	4	**Kansas City Chiefs**	4
Kansas City Chiefs	4	**New Orleans Saints**	4
Pittsburgh Steelers	5	**Carolina Panthers**	5
Seattle Seahawks	5	**Tennessee Titans**	5
Baltimore Ravens	6	**Atlanta Falcons**	6
Atlanta Falcons	6	**Buffalo Bills**	6
Detroit Lions	7	Baltimore Ravens	7
Carolina Panthers	7	Detroit Lions	7
Dallas Cowboys	8	Los Angeles Chargers	8
Tennessee Titans	8	Seattle Seahawks	8
Buffalo Bills	9	Cincinnati Bengals	9
Chicago Bears	9	Dallas Cowboys	9
Cincinnati Bengals	10	Arizona Cardinals	10
Washington Redskins	10	Oakland Raiders	10
Tampa Bay Buccaneers	11	Green Bay Packers	11
San Francisco 49ers	11	Miami Dolphins	11
New York Jets	12	Denver Broncos	12
Arizona Cardinals	12	Washington Redskins	12
Oakland Raiders	13	New York Jets	13
Green Bay Packers	13	San Francisco 49ers	13
Houston Texans	14	Indianapolis Colts	14
Miami Dolphins	14	Tampa Bay Buccaneers	14
Indianapolis Colts	15	Chicago Bears	15
Denver Broncos	15	Houston Texans	15
New York Giants	16	Cleveland Browns	16
Cleveland Browns	16	New York Giants	16

Lasso Model

- glm(OVR.RANK ~ X4DAtt + TO.pctg + X50.plus.FGM + PA + PD + DSRS + QB.Cmbck + GWD)

```
Call:
glm(formula = OVR.RANK ~ X4DAtt + TO.pctg + X50.plus.FGM + PA +
    PD + DSRS + QB.Cmbck + GWD, data = nflnum)

Deviance Residuals:
    Min       1Q    Median       3Q      Max
-5.3624  -1.5323    0.1472   1.4482   4.3696

Coefficients:
               Estimate Std. Error t value Pr(>|t|)
(Intercept)   11.094948   8.665676   1.280   0.2045
X4DAtt         0.059731   0.066444   0.899   0.3716
TO.pctg        0.118254   0.103586   1.142   0.2574
X50.plus.FGM   0.405141   0.137060   2.956   0.0042 **
PA            -0.013460   0.023395  -0.575   0.5668
PD            -0.036290   0.004754  -7.634 6.84e-11 ***
DSRS          -0.273302   0.319548  -0.855   0.3952
QB.Cmbck      -0.359849   0.361948  -0.994   0.3234
GWD           -0.214002   0.381154  -0.561   0.5762
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 4.868153)

    Null deviance: 1595.22  on 81  degrees of freedom
Residual deviance:  355.38  on 73  degrees of freedom
  (14 observations deleted due to missingness)
AIC: 372.96

Number of Fisher Scoring iterations: 2
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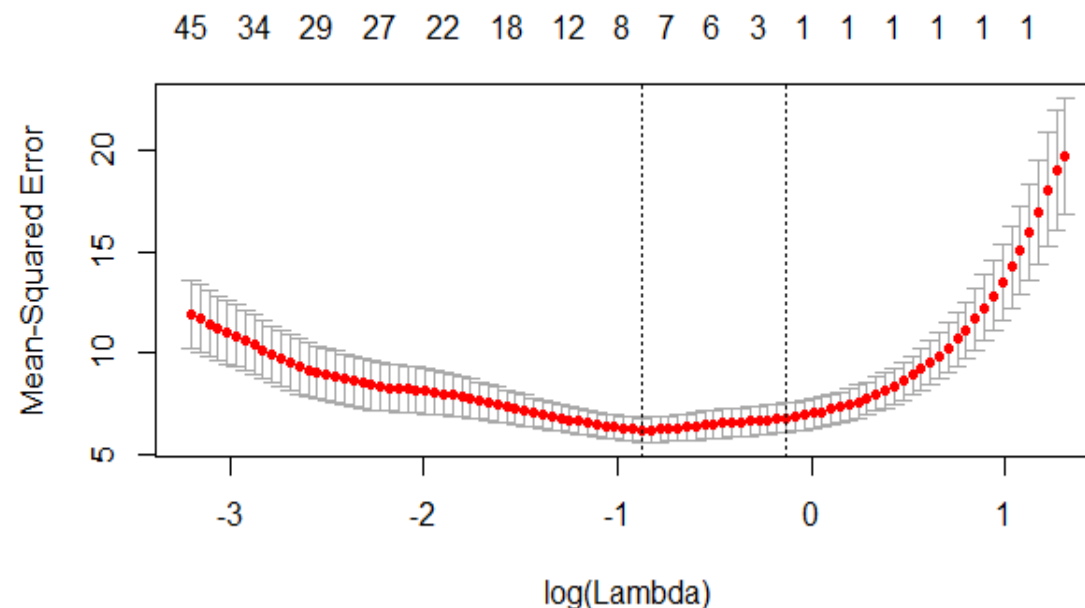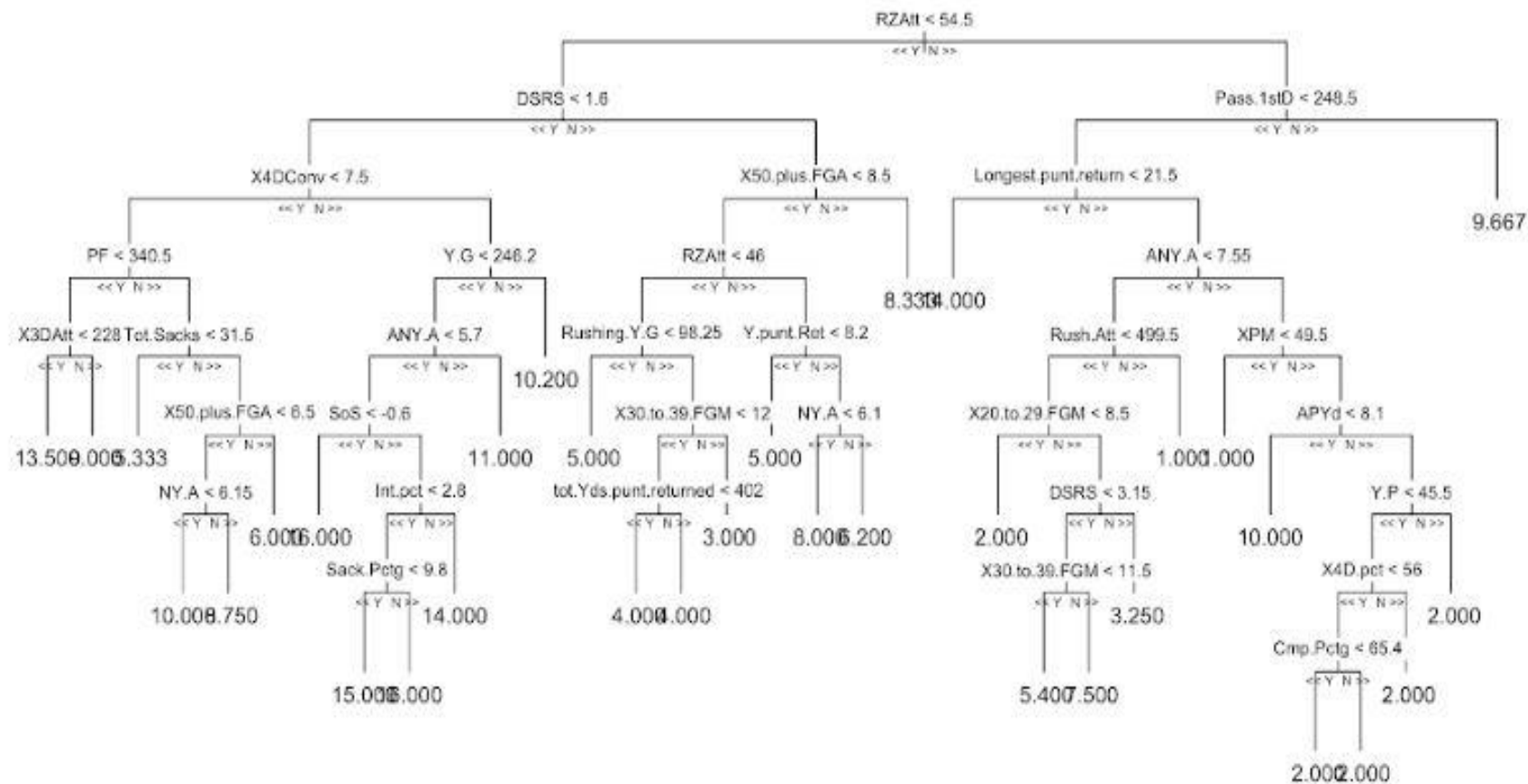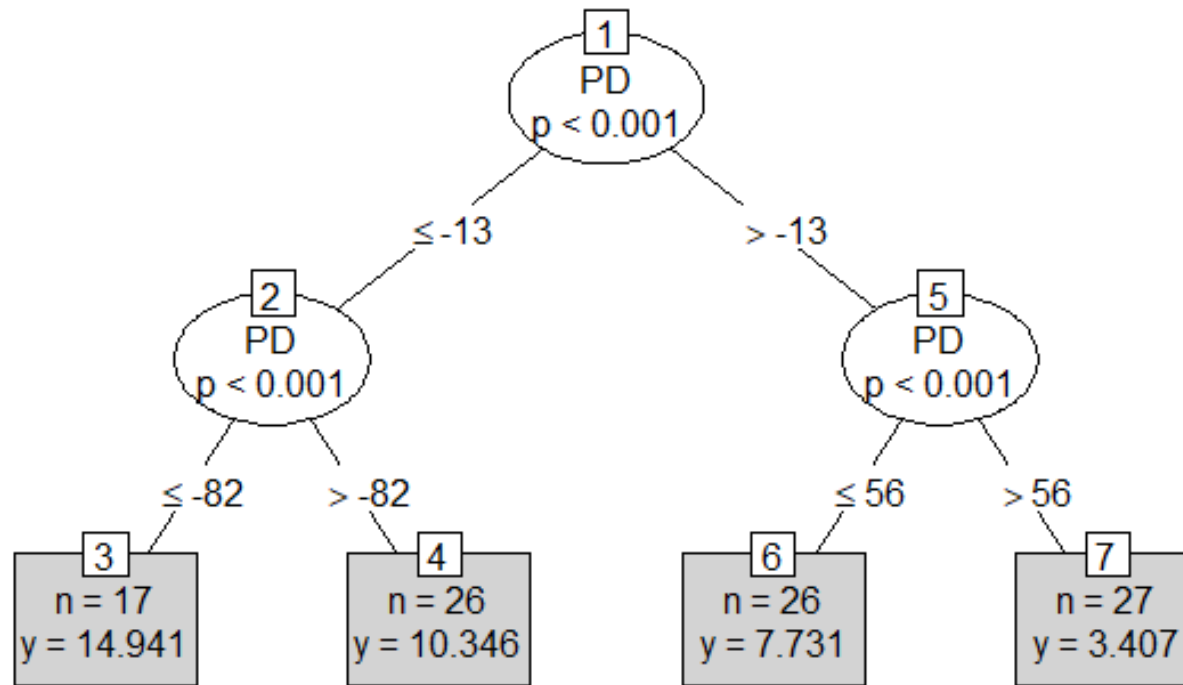
Predictions vs Actual - Lasso

Tm	2017 Lasso Predictions	Tm	2017 Actual
New England Patriots	1	**New England Patriots**	1
Jacksonville Jaguars	1	**Philadelphia Eagles**	1
Minnesota Vikings	2	**Minnesota Vikings**	2
New Orleans Saints	2	**Pittsburgh Steelers**	2
Los Angeles Chargers	3	**Jacksonville Jaguars**	3
Philadelphia Eagles	3	**Los Angeles Rams**	3
Pittsburgh Steelers	4	**Kansas City Chiefs**	4
Los Angeles Rams	4	**New Orleans Saints**	4
Pittsburgh Steelers	5	**Carolina Panthers**	5
Kansas City Chiefs	5	**Tennessee Titans**	5
Dallas Cowboys	6	**Atlanta Falcons**	6
Tennessee Titans	6	**Buffalo Bills**	6
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Indianapolis Colts	14	Tampa Bay Buccaneers	14
Baltimore Ravens	15	Chicago Bears	15
Seattle Seahawks	15	Houston Texans	15
Denver Broncos	16	Cleveland Browns	16
Cleveland Browns	16	New York Giants	16

Random Forest

C Tree Model

For Kicks and Giggles...

▶ Used 13 weeks of 2018 Data (same source) and ran it over our first linear model

▶ lm(OVR.RANK ~ PA + Int + tot.FL + SoS + X4DAtt + PF + ANY.A + QB.Rating + RZAtt + Rush.Att,

Tm	2018 Predictions	Tm	2018 Actual
New Orleans Saints	1	Kansas City Chiefs	1
Chicago Bears	1	Los Angeles Rams	1
Kansas City Chiefs	2	New England Patriots	2
Los Angeles Rams	2	New Orleans Saints	2
Seattle Seahawks	3	Chicago Bears	3
Los Angeles Chargers	3	Houston Texans	3
New England Patriots	4	Dallas Cowboys	4
Dallas Cowboys	4	Los Angeles Chargers	4
Houston Texans	5	Minnesota Vikings	5
Minnesota Vikings	5	Pittsburgh Steelers	5
Baltimore Ravens	6	Seattle Seahawks	6
Carolina Panthers	6	Baltimore Ravens	6
Indianapolis Colts	7	Carolina Panthers	7
Washington Redskins	7	Miami Dolphins	7

Questions?