

# What factors determine ticket prices for NFL games?



684 project  
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# Data Set

- 2014 NFL Divisional Tickets
- <https://www.kaggle.com/fivethirtyeight/fivethirtyeight-nfl-ticket-prices-dataset/version/106>
- Average ticket prices for divisional games during the 2014 season
  - The NFL has 8 division with 4 teams each
  - Every team plays every other team in its division twice, home and away, every season, for a total of 6 divisional games
  - The other 10 games per season, per team, are not included in this data set



(this is a superb owl, unrelated)

- Also:  
[www.pro-football-reference.com](http://www.pro-football-reference.com)
- Super Bowl results
  - Number of Super Bowls won per team
  - Number of Super Bowls played
- 2013 team data
  - Average attendance for each team, home and away
  - Winning Percentage for each team

# All Factors Model

Output = Ticket Price

Inputs:

- Home Team SB Won
- Home Team SB Total
- Home Team 2013 Win %
- Away Team SB Won
- Away Team SB Total
- Away Team 2013 Win %
- Home Team Home Attendance
- Away Team Away Attendance

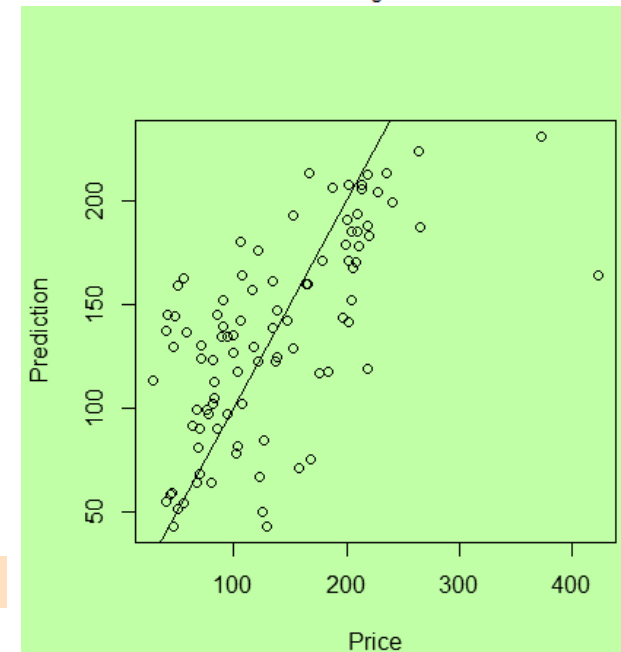
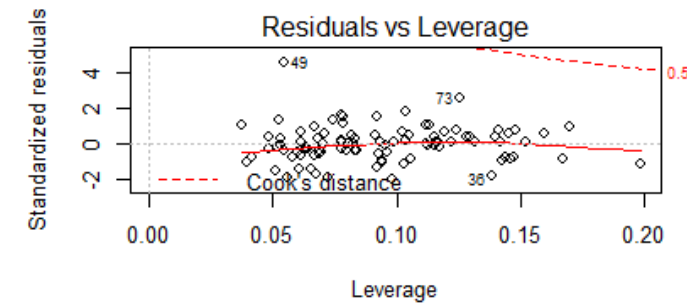
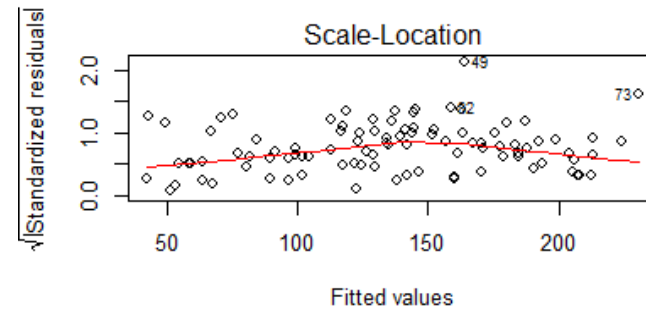
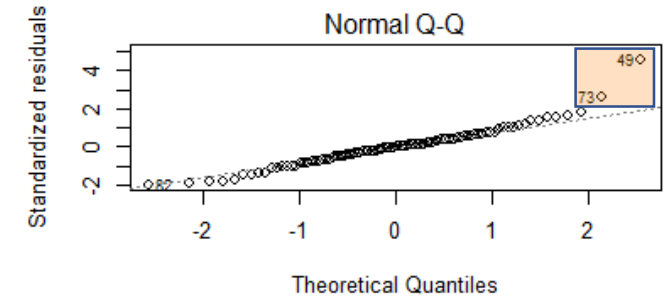
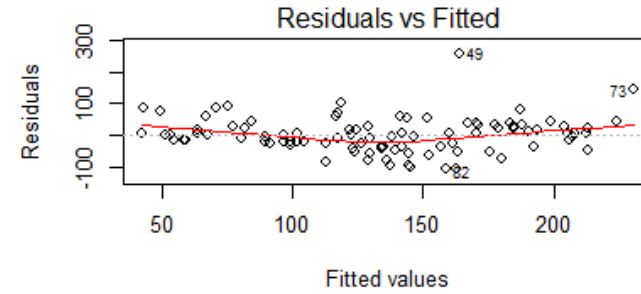
Coefficients:

	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	-6.009e+02	1.760e+02	-3.414	0.000974	***
Home.SB.W	1.274e+01	6.607e+00	1.928	0.057066	.
Home.SB.G	-7.307e+00	4.950e+00	-1.476	0.143462	
Home.2013.Wp	1.669e+02	3.404e+01	4.903	4.34e-06	***
Home.2013.Att	1.439e-04	1.051e-04	1.369	0.174493	
Away.SB.W	9.644e+00	6.414e+00	1.504	0.136275	
Away.SB.G	-1.564e+00	4.738e+00	-0.330	0.742120	
Away.2013.Wp	4.406e+01	3.374e+01	1.306	0.195037	
Away.2013.Att	9.980e-04	3.060e-04	3.261	0.001585	**
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Residual standard error: 58.02 on 87 degrees of freedom

Multiple R-squared: 0.427, Adjusted R-squared: 0.3744

F-statistic: 8.105 on 8 and 87 DF, p-value: 4.029e-08



# BIC Selection

Output = Ticket Price

Selected Inputs:

- Home Team 2013 Win %
- Away Team SB Won
- Away Team Away Attendance

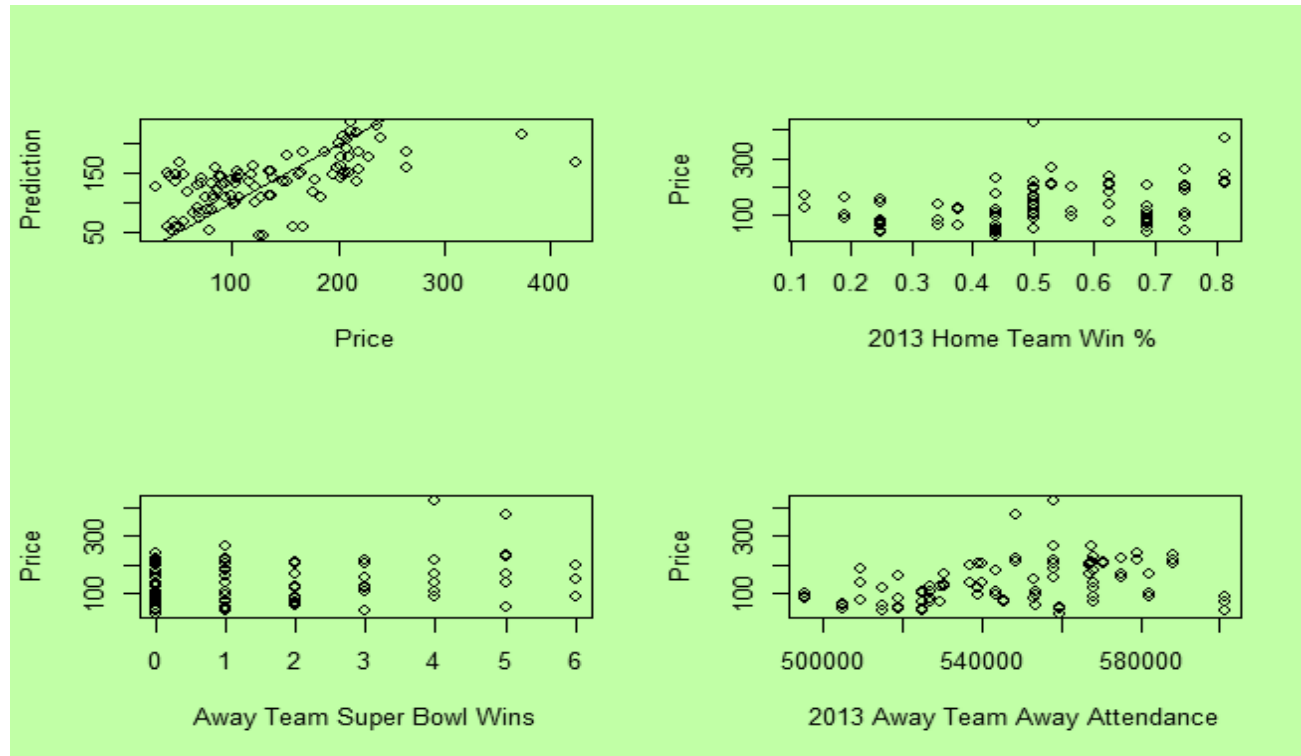
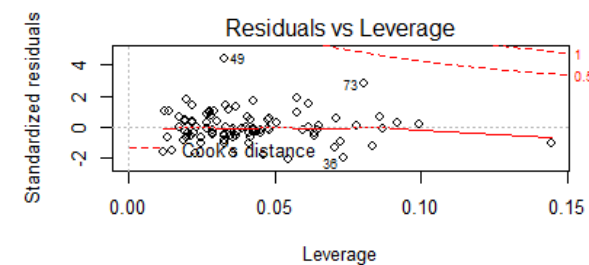
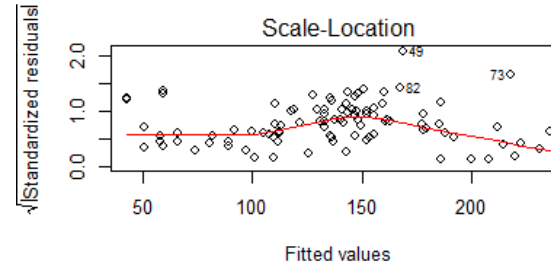
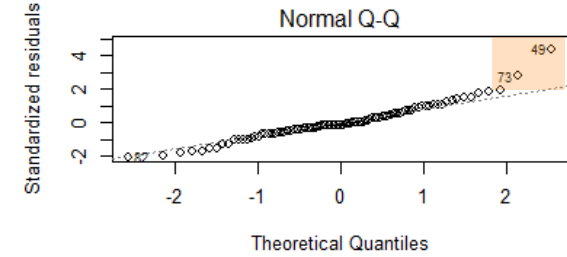
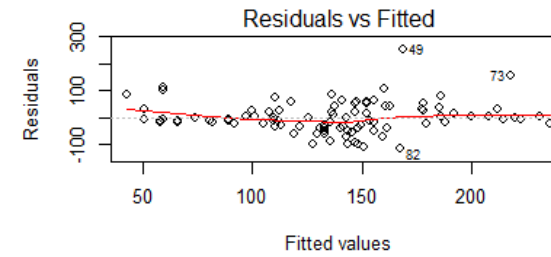
Coefficients:

	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	-5.711e+02	1.314e+02	-4.346	3.57e-05	***
Home.2013.Wp	1.654e+02	3.144e+01	5.261	9.30e-07	***
Away.SB.W	8.019e+00	3.496e+00	2.294	0.0241	*
Away.2013.Att	1.119e-03	2.372e-04	4.718	8.47e-06	***

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Residual standard error: 58.87 on 92 degrees of freedom

Multiple R-squared: 0.3762, Adjusted R-squared: 0.3559

F-statistic: 18.49 on 3 and 92 DF, p-value: 1.797e-09



# Outliers



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Division	Price	Away	Home	Day	Home.SB.W	Home.SB.G	Home.2013.Wp	Home.2013.Att	Away.SB.W	Away.SB.G	Away.2013.Wp	Away.2013.Att
49 NFC North	423	Green Bay Packers	Chicago Bears	2014-09-28	1	2	0.5	498864	4	5	0.531	558211

Division	Price	Away	Home	Day	Home.SB.W	Home.SB.G	Home.2013.Wp	Home.2013.Att	Away.SB.W	Away.SB.G	Away.2013.Wp	Away.2013.Att
73 NFC West	373	San Fran. 49ers	Seattle Seahawks	2014-12-14	1	2	0.813	545577	5	6	0.75	548556



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Top two outliers for both models:

- Major rivalry games, but there are many rivalry games that are not outliers
  - Whether a game is a rivalry game would be an interesting feature to include
- These are the 2 most expensive games (the next two are also between the same teams)

# Conclusions



- The 3 selected factors can be viewed as follows:
  - Away Team Super Bowls won: Visiting team's prestige
  - Away Team Away Attendance: Visiting team's excitement factor
  - Home Team Win %: Likelihood for the home team to win
- An increase in these 3 factors shows a correlation for an increase in ticket price
- There are additional sources of variation that are unaccounted for. Some possible factors might include: rivalry game, wealth of home city, proximity of away team, or some measure of playoff berth likelihood
- Likely the previous year's ticket prices would be the key indicator for this year's ticket prices, but would not make for insightful analysis