




Contributing Factors to Total Points Scored in an NFL Game



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Motivation



Data (Decisions)

2011 Week Summaries

Weekly leaders, boxscores, & previews

Week 1 Week 2 Week 3 Week 4 Week 5 Week 6 Week 7 Week 8 Week 9 Week 10 Week 11 Week 12 Week 13 Week 14 Week 15 Week 16 Week 17

Wild Card Divisional Conf Champ Super Bowl

2011 Week 1

<p>Sep 8, 2011</p> <p>New Orleans Saints 34 Final</p> <p>Green Bay Packers 42</p> <p>PassYds Brees-NOR 419</p> <p>RushYds Starks-GNB 57</p> <p>RecYds Henderson-NOR 100</p>	<p>Sep 11, 2011</p> <p>Philadelphia Eagles 3 Final</p> <p>St. Louis Rams 13</p> <p>PassYds Bradford-STL 188</p> <p>RushYds McCoy-PHI 122</p> <p>RecYds Jackson-PHI 102</p>	<p>Sep 11, 2011</p> <p>Pittsburgh Steelers 7 Final</p> <p>Baltimore Ravens 35</p> <p>PassYds Roethlisberger-PIT 280</p> <p>RushYds Rice-BAL 107</p> <p>RecYds Wallace-PIT 107</p>	<p>Sep 11, 2011</p> <p>Tennessee Titans 14 Final</p> <p>Jacksonville Jaguars 16</p> <p>PassYds Hasselbeck-TEN 263</p> <p>RushYds Jones-Den-JAX 97</p> <p>RecYds Blitt-TEN 136</p>	<p>Sep 11, 2011</p> <p>Indianapolis Colts Final</p> <p>Houston Texans 34</p> <p>PassYds Schaub-HOU 220</p> <p>RushYds Tate-HOU 116</p> <p>RecYds Wayne-IND 106</p>
<p>Sep 11, 2011</p> <p>Cincinnati Bengals 27 Final</p> <p>Cleveland Browns 17</p> <p>PassYds McCoy-CLE 213</p> <p>RushYds Benson-CIN 121</p> <p>RecYds Massachusetts-CIN 77</p>	<p>Sep 11, 2011</p> <p>Atlanta Falcons 1 Final</p> <p>Chicago Bears 30</p> <p>PassYds Ryan-ATL 319</p> <p>RushYds Turner-ATL 100</p> <p>RecYds Forte-CHI 90</p>	<p>Sep 11, 2011</p> <p>Detroit Lions 27 Final</p> <p>Tampa Bay Buccaneers 20</p> <p>PassYds Stafford-DET 305</p> <p>RushYds Beal-DET 72</p> <p>RecYds Johnson-DET 88</p>	<p>Sep 11, 2011</p> <p>Buffalo Bills 41 Final</p> <p>Kansas City Chiefs 7</p> <p>PassYds Elizakovich-BUF 208</p> <p>RushYds Jackson-BUF 112</p> <p>RecYds Zied-CHI 66</p>	<p>Sep 11, 2011</p> <p>Carolina Panthers 2 Final</p> <p>Arizona Cardinals 28</p> <p>PassYds Newton-CAR 422</p> <p>RushYds Watts-ARI 90</p> <p>RecYds Smith-CAR 178</p>
<p>Sep 11, 2011</p> <p>Minnesota Vikings 1 Final</p> <p>San Diego Chargers 24</p> <p>PassYds Rivers-SDG 335</p> <p>RushYds Peterson-MIN 98</p> <p>RecYds Gates-SDG 74</p>	<p>Sep 11, 2011</p> <p>Seattle Seahawks 1 Final</p> <p>San Francisco 49ers 33</p> <p>PassYds Jackson-SEA 197</p> <p>RushYds Gore-SFO 72</p> <p>RecYds Baldwin-SEA 83</p>	<p>Sep 11, 2011</p> <p>New York Giants 14 Final</p> <p>Washington Redskins 28</p> <p>PassYds Grossman-WAS 305</p> <p>RushYds Hightower-WAS 72</p> <p>RecYds Nicks-NYG 122</p>	<p>Sep 11, 2011</p> <p>Dallas Cowboys 2 Final</p> <p>New York Jets 27</p> <p>PassYds Romo-DAL 342</p> <p>RushYds Jones-DAL 44</p> <p>RecYds Witten-DAL 110</p>	<p>Sep 12, 2011</p> <p>New England Patriots 3 Final</p> <p>Miami Dolphins 24</p> <p>PassYds Brady-NWE 517</p> <p>RushYds Woodhead-NWE 68</p> <p>RecYds Welter-NWE 160</p>
<p>Sep 12, 2011</p> <p>Oakland Raiders 2 Final</p> <p>Denver Broncos 20</p> <p>PassYds Orton-DEN 304</p> <p>RushYds McFadden-OAK 150</p> <p>RecYds Lloyd-DEN 89</p>				

	1	2	3	4	Final
 New Orleans Saints	7	10	10	7	34
 Green Bay Packers	21	7	7	7	42

Expected Points Summary

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Glossary

	Offense					Defense				Special Teams						
Tm	Total	Tot	Pass	Rush	TOvr	Tot	Pass	Rush	TOvr	Tot	KO	KR	P	PR	FG/XP	
Packers	8.00	23.08	19.69	3.92	0.00	19.92	-19.30	-0.62	3.32	-1.53	-4.25	11.38	-6.42	-1.07	-1.17	
Saints	-8.00	19.92	19.30	0.62	-3.32	23.08	-19.69	-3.92	0.00	1.53	-11.38	4.25	1.07	6.42	1.17	

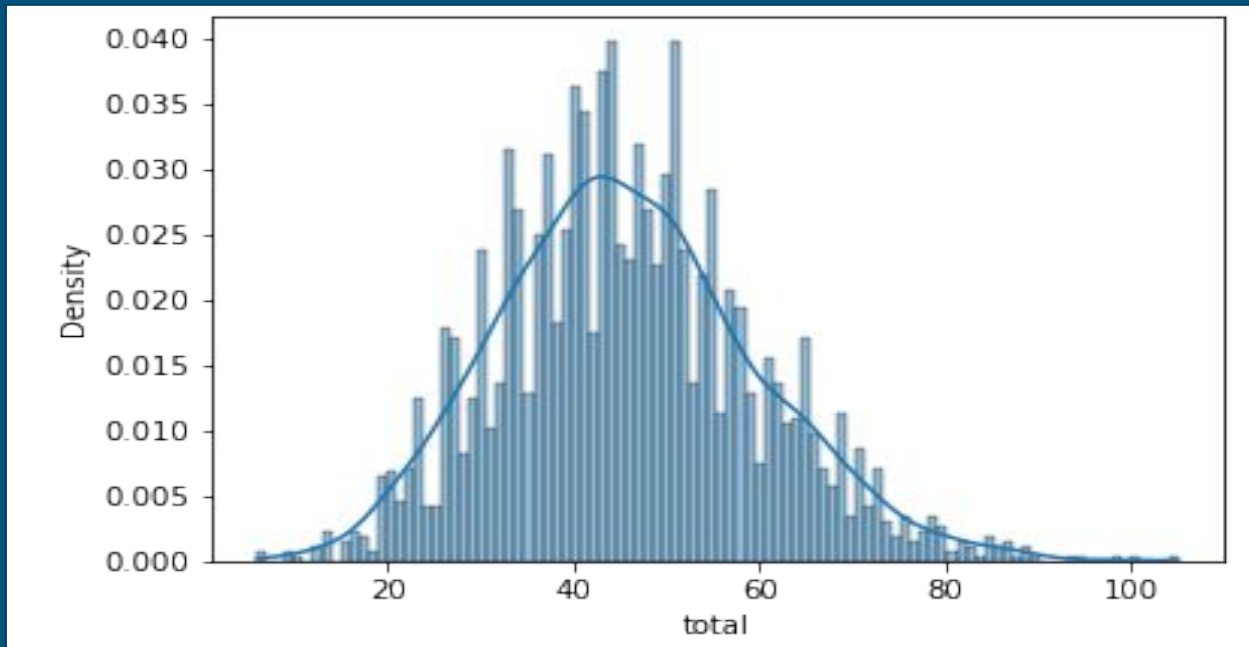
Team Stats

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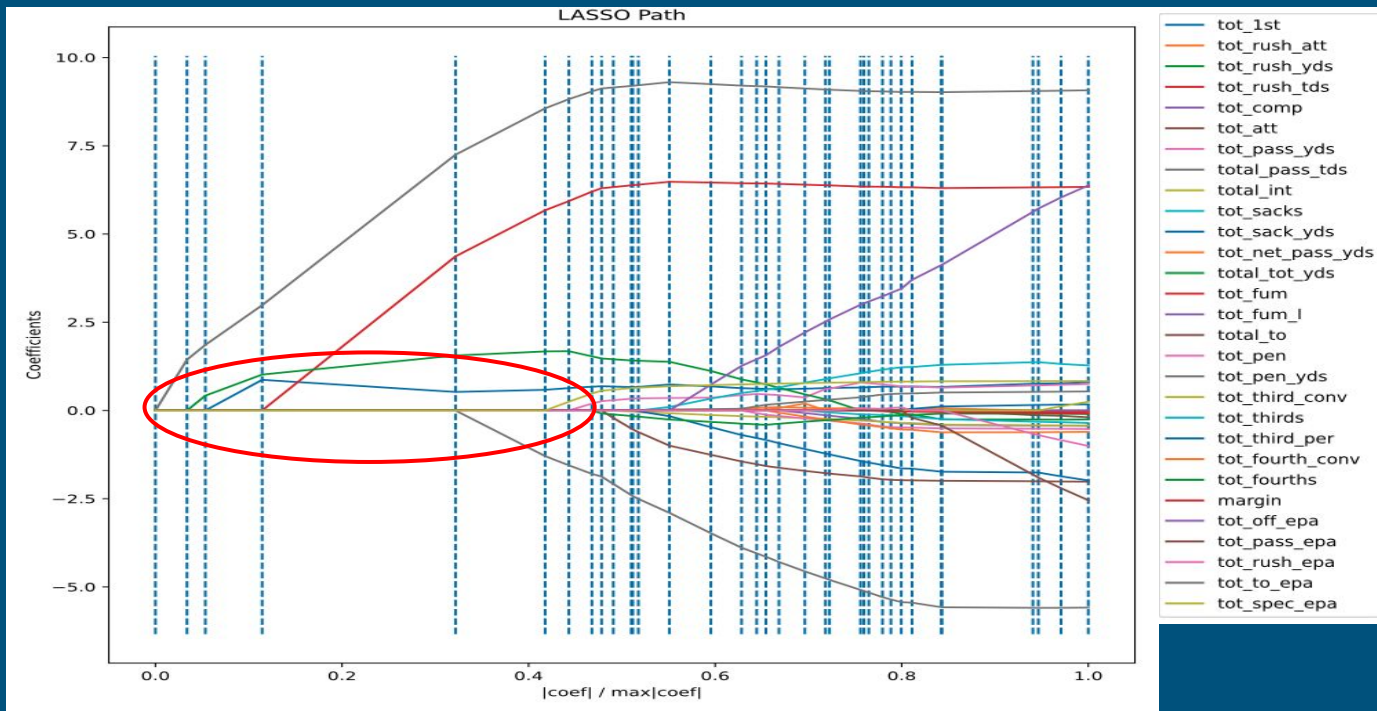
	NOR	GNB
First Downs	27	27
Rush-Yds-TDs	21-81-0	27-103-2
Cmp-Att-Yd-TD-INT	32-49-419-3-0	27-35-312-3-0
Sacked-Yards	3-23	2-16
Net Pass Yards	396	296
Total Yards	477	399
Fumbles-Lost	2-1	0-0
Turnovers	1	0
Penalties-Yards	3-15	6-48
Third Down Conv.	9-14	8-12
Fourth Down Conv.	0-1	0-0
Time of Possession	27:06	32:54

Target Distribution

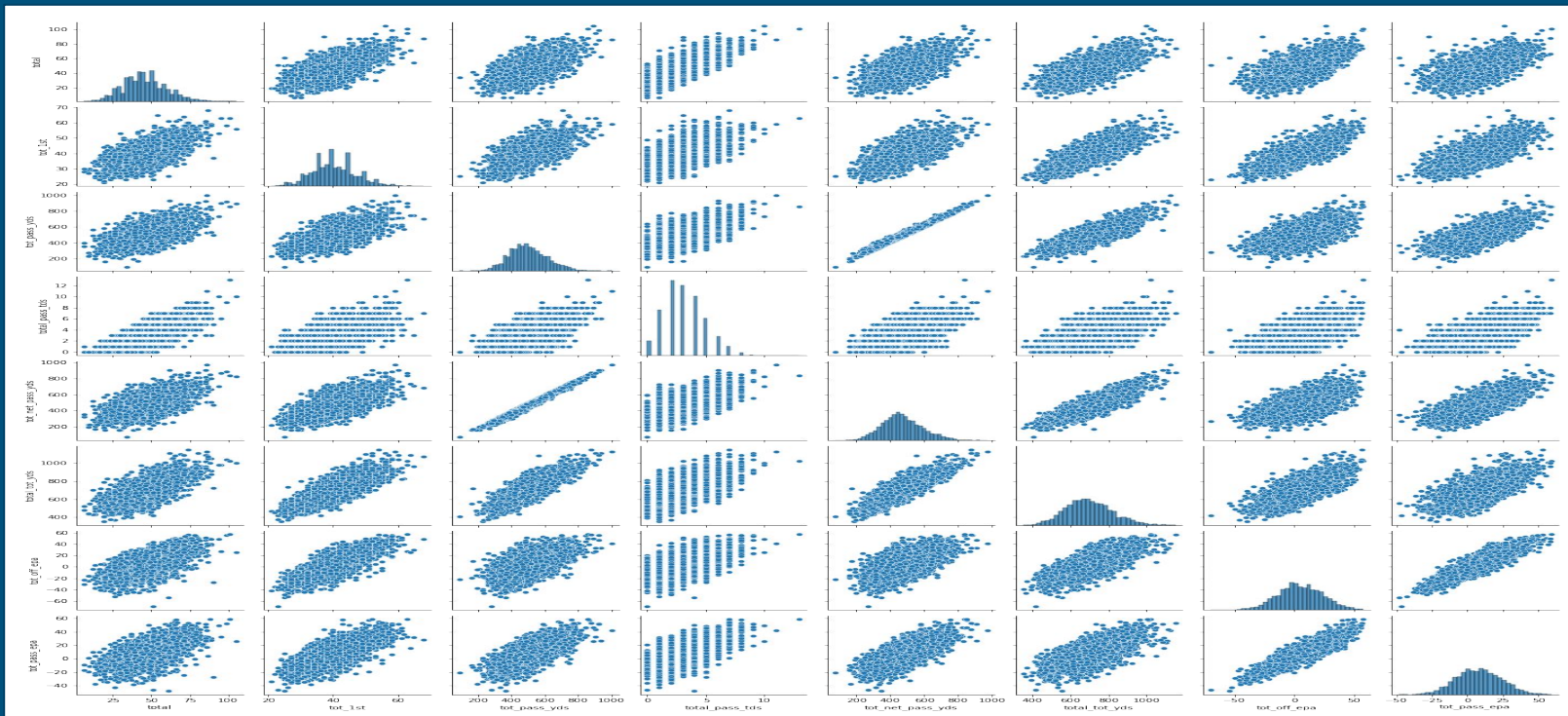
- Mean: 46 points
- Std dev: 14 points
- Most games between 32 - 60



Feature Insights/Selection



Feature Interactions



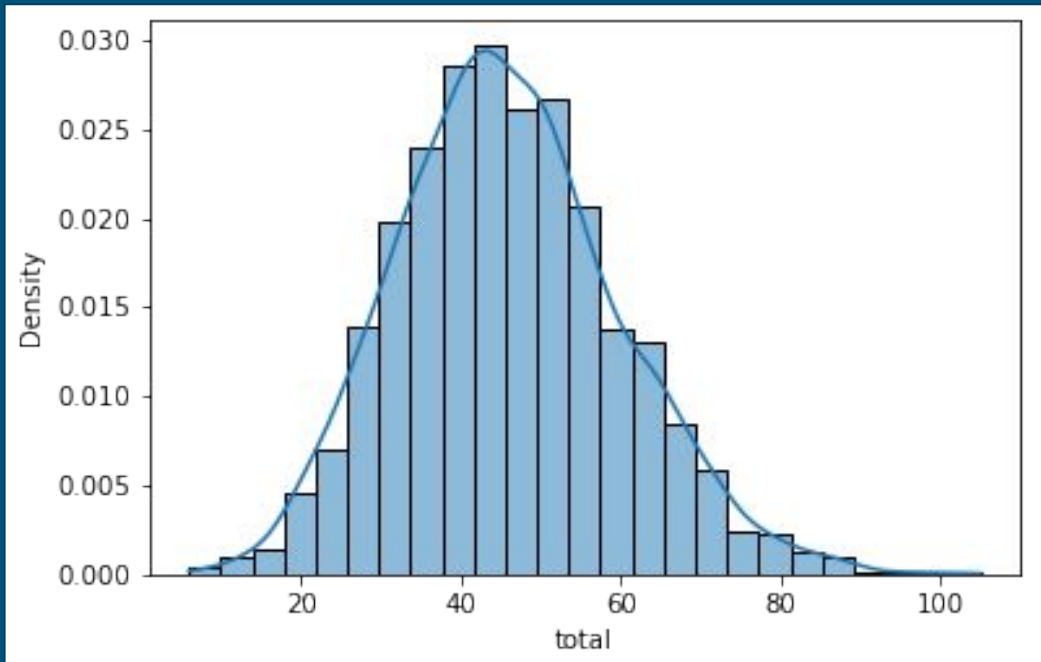
Regression Results Compared to Target

Linear CV:

- $R^2 = 0.67$
- MAE = 6.3 points
 - ~1 TD off

LASSO CV:

- $R^2 = 0.86$
- MAE = 4.2 points
 - ~1 FG better



Takeaways & New Applications

1. Passing Touchdowns biggest contributor
2. Turnover Expected Points Added biggest detractor
3. Get first downs
4. Rushing is generally a miss, except near the goal line
5. (Football numbers are important)

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- Throw away game or huge problem for a team?
 - Game plan strategies
 - Setting betting lines

Future Work

- Case studies (2020 Ravens vs 2020 Buccaneers)
- Interaction terms
- Other regression methods(??)
- Break down statistics further
 - Team by team basis
 - QB by QB
- Use more data (pre-2011)
- Incorporate weather
- Use statistics that can be known before the game

Appendix

- GitHub repository: <https://github.com/jseemayer2/project-2>
- Pro-Football-Reference: <https://www.pro-football-reference.com>