



STT 180 Semester Project:

2019 College Football Data Analysis

JOSH WOLF

Introduction

- ▶ I analyzed a dataset for the 2019 College Football Season
 - ▶ The dataset includes numerous variables that describe each FBS team's season. Some of the data that is included are games won/loss, offense/defense rankings, turnover data, and touchdown data.
 - ▶ I focused on the Power 5 Conferences (BIG10/BIG12/SEC/ACC/PAC12)

Team <chr>	Games <int>	Win.Loss <chr>	Off.Rank <int>	Off.Plays <int>	Off.Yards <int>	Off.Yards.Play <dbl>	Off.TDs <int>	Off.Yards.per.Game <dbl>	Def.Rank <int>
Air Force (Mountain West)	13	11-2	51	881	5483	6.22	55	421.8	17
Akron (MAC)	12	0-12	130	725	2918	4.02	14	243.2	83
Alabama (SEC)	13	11-2	6	842	6640	7.89	76	510.8	20
Appalachian St. (Sun Belt)	14	13-1	39	969	6064	6.26	65	433.1	26
Arizona (Pac-12)	12	4-8	30	873	5281	6.05	42	440.1	120
Arizona St. (Pac-12)	13	8-5	94	842	4837	5.74	34	372.1	67
Arkansas (SEC)	12	2-10	111	783	4081	5.21	28	340.1	110
Arkansas St. (Sun Belt)	13	8-5	33	925	5711	6.17	50	439.3	124
Army West Point (FBS Independent)	13	5-8	89	869	4929	5.67	51	379.2	30
Auburn (SEC)	13	9-4	64	947	5285	5.58	51	406.5	28
Ball St. (MAC)	12	5-7	16	909	5556	6.11	51	463.0	91
Baylor (Big 12)	14	11-3	52	948	5901	6.22	59	421.5	39
Boise St. (Mountain West)	14	12-2	48	993	6006	6.05	58	429.0	33
Boston College (ACC)	13	6-7	47	964	5579	5.79	47	429.2	125
Bowling Green (MAC)	12	3-9	120	839	3829	4.56	24	319.1	117
Buffalo (MAC)	13	8-5	82	937	5051	5.39	50	388.5	7

1-16 of 130 rows | 1-10 of 146 columns

Previous 1 2 3 4 5 6 ... 9 Next

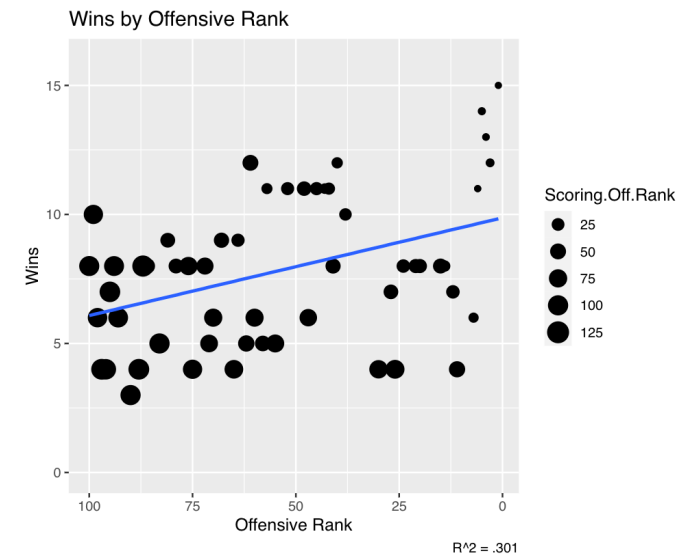
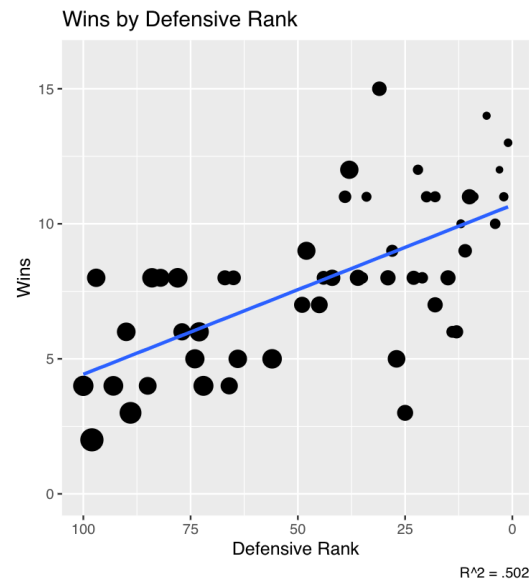
Research Aims

- ▶ Research questions:
 - ▶ Does offense or defense have a bigger impact on the success of a team?
 - ▶ Which collegiate conference is the best (out of the Power-5)?
 - ▶ How much of an effect do turnovers have on winning?
 - ▶ Which team is most likely to win the championship?



Does Offense or Defense have a bigger impact on the success of a team?

- ▶ General Linear Model for predicting Wins from a team's Offensive and Defensive Ranks
- ▶ $\hat{Y} = 12.88 - 0.0404(\text{Off. Rank}) - 0.0526(\text{Def. Rank})$
- ▶ $R^2 = 0.74$
- ▶ Conclusion: A team's Defensive Rank is more important than Offensive Rank



Which collegiate conference is the best?

- ▶ In terms of quality, ACC and SEC are the best conferences.
 - ▶ Quality is measured by the number of teams with 6 or more wins. These teams are all bowl eligible.

Conference <chr>	n <int>
ACC	11
SEC	10
Big 10	9
PAC 12	7
Big 12	6

5 rows

- ▶ In terms of Championship caliber teams, Big10 and SEC are the best conference.
 - ▶ Championship caliber is measured by the number of teams with 10 or more wins.

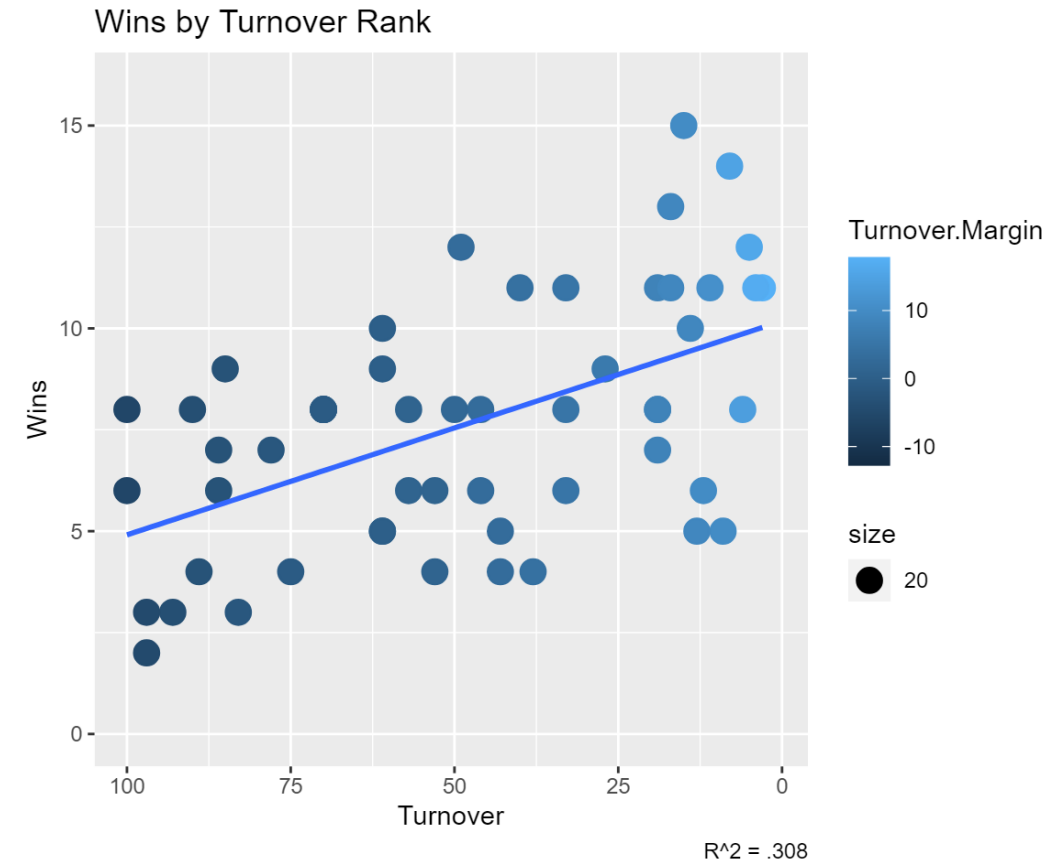
Conference <chr>	n <int>
Big 10	5
SEC	4
ACC	2
Big 12	2
PAC 12	2

5 rows

Conclusion: SEC is the best conference, because it has good quality and teams.

How much of an affect do turnovers have on winning games?

- ▶ General linear model for predicting wins from a team's turnover rank.
 - ▶ $\hat{Y} = 9.935 - 0.045(\text{turnover rank})$
 - ▶ $R^2 = 0.308$



Which team is most likely to win the championship?

- ▶ General Linear Model Predicting Wins by Defensive Rank, Offensive Rank, and Turnover Rank

- ▶ $\hat{Y} = 13.27 - 0.034(\text{Off.Rank}) - 0.048(\text{Def.Rank}) - 0.018(\text{Turn.Rank})$
- ▶ $R^2 = 0.77$

- ▶ Filtering by
 - ▶ Defensive Rank ≤ 20
 - ▶ Turnover Rank ≤ 25
 - ▶ Offensive Rank ≤ 30

Team <chr>	Conference <chr>	Games <int>	W <dbl>	L <dbl>	Def.Rank <int>	Turnover.Rank <int>	Off.Rank <int>
Alabama (SEC)	SEC	13	11	2	20	3	6
Clemson (ACC)	ACC	15	14	1	6	8	5
Ohio St. (Big Ten)	Big 10	14	13	1	1	17	4

Predicted Champion:
Ohio State University

Conclusion

- ▶ Overall...
 - ▶ Defense has the largest effect on a team's success
 - ▶ The SEC is the strongest conference in terms of quality and championship caliber teams
 - ▶ Turnovers have somewhat of a strong impact on winning a game
 - ▶ Predicted that Ohio State University should have won the Championship
- ▶ Research could have been more precise by focusing on all 130 FBS teams (instead of only Power 5)
- ▶ In 2019, LSU won the Championship, Ohio State finished #3

References:

- ▶ <https://njmarlins.com/home/ncaa-college-football-logo/>
- ▶ [college-football-team-stats-2019](#)