



DATA 300

Winning on the Field, Growing in the Classroom: Football’s Effect on University Enrollment

Grace Coccagna, Jenna Nowland, George Thorp, Ryan Thompson

Dickinson

Introduction

For many large universities, football is more than just a game—it’s a defining aspect of campus culture and an important driver of public perception. A successful football program can elevate a school’s reputation, attract prospective students, and even boost alumni donations. These impacts are often reflected in changes to enrollment, which makes this topic relevant to understanding how athletics influence broader institutional success.

This project is important because it allows us to explore the relationship between sports and education from a data-driven perspective. As students, we often hear about the reputation of certain schools being connected to their athletics, but analyzing these trends with real data helps us better understand if and how football performance correlates with factors like enrollment growth. Understanding these connections is valuable for university decision-makers, sports fans, and anyone interested in how large institutions operate. It’s also personally relevant as students navigating the intersection of academics, athletics, and data.

Objectives

- Analyze Enrollment Trends:** Examine historical data to identify patterns and changes in student enrollment at large universities.
- Evaluate Football Success:** Measure the performance of university football teams using metrics like win percentages, bowl appearances, and championships.
- Explore Relationships:** Investigate correlations between football team success and changes in student enrollment over time.
- Create Visuals:** Develop graphs and charts to effectively communicate trends, correlations, and key findings from the analysis.
- Analysis and Insights:** Highlight how athletic success may influence university branding, admissions, and student engagement. Offer insights for university administrators on leveraging athletics to boost enrollment.

Methods

- For this project, we applied **statistical analysis techniques** to examine the relationship between university enrollment trends and the performance of their football teams. The primary tool used for the analysis was **logistic regression**, which was appropriate given the binary nature of the target variable (e.g., success or failure of the football team in relation to enrollment trends). Logistic regression allows us to model the probability of an event occurring, making it ideal for our predictive analysis.
- To support the logistic regression model, we utilized **Python** and key libraries, including **Pandas** for data manipulation, **Matplotlib** and **Seaborn** for visualizations, and **Scikit-learn** for model building. These tools were chosen due to their versatility, ease of implementation, and strong support for machine learning and statistical modeling.
- The dataset used in this project includes data on university enrollment figures and football team performance, sourced from Sports-Reference and each college's enrollment numbers on their website. The dataset spans multiple years and includes variables such as Percent Change (PC) in enrollment, Winning Percentage (Win Pct), Wins, Losses, US College Ranking, and more. These features were selected for their relevance in understanding the potential impact of football success on university enrollment. Data from the years affected from Covid-19 were removed.

Results

Clustering Analysis

Cluster 2 (Yellow): Represents larger universities with high enrollment and strong football performance (high wins and win percentages).

- Insight:** Schools with successful football programs tend to have larger enrollments, highlighting a connection between enrollment size and football success.

Wins and Enrollment Relationship

Wins Analysis:

- Statistical tests (t-test and regression) show **no significant difference** in team wins based on conference membership (p-value = 0.325; R-squared = 0.003).

Indirect Relationship:

- While conference membership does not directly impact wins, clustering results suggest that **schools with higher enrollment** tend to perform better in football.

Enrollment Analysis

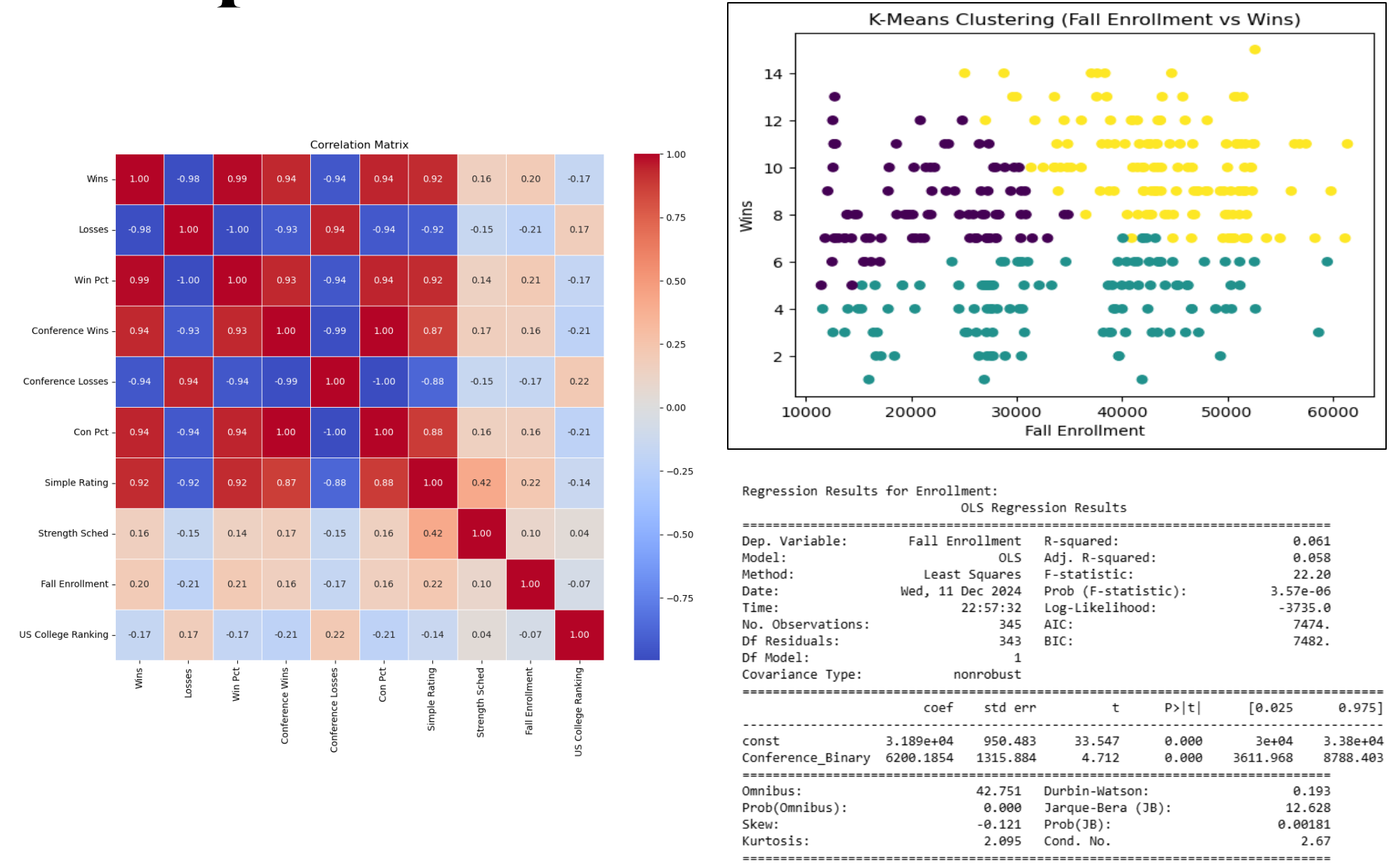
T-test: Conference membership significantly impacts enrollment size (p-value = 3.57e-06), with SEC schools having **larger enrollments on average**.

Regression Results:

- R-squared:** 0.061 (6.1% of enrollment variance explained).
- Coefficient:** SEC membership is associated with an **average increase of ~6200 students** compared to Big Ten schools.
- Conclusion:** Larger schools, often in strong athletic conferences like the SEC, are associated with higher enrollments, which may indirectly support stronger football performance.

Key Takeaway

While conference membership does not directly influence wins, it significantly affects enrollment size. Larger schools, typically part of stronger athletic programs, are linked to both higher enrollments and better football success.



Big10 Team Averages (sorted by Win Pct):

Enrollment	Win Pct	PC in
School		
Ohio State	0.858400	1.408285
Wisconsin	0.745667	0.636496
Penn State	0.714600	0.999821
Michigan State	0.625133	0.705538
Michigan	0.623733	1.331474
Iowa	0.618000	0.678795
Northwestern	0.553000	1.594969
Minnesota	0.485000	0.027518
Indiana	0.390533	0.950981
Purdue	0.387133	1.022896
Illinois	0.358333	1.700770

-Ohio State has largest total enrollment of 66,901 (Fall 2024).

-Northwestern has smallest total enrollment of 8,523.

SEC Team Averages (sorted by Win Pct):

Enrollment	Win Pct	PC in
School		
Alabama Crimson Tide.	0.839200	4.093628
Louisiana State Tigers	0.777467	-0.004804
Georgia Bulldogs	0.733467	1.049751
Florida Gators	0.701933	0.390952
Auburn Tigers	0.655400	1.942457
South Carolina	0.584533	2.108238
Mississippi State	0.530867	2.352839
Tennessee Volunteers.	0.521067	0.849089
Arkansas	0.485400	3.194374
Kentucky	0.472400	1.048227
Ole Miss	0.468067	2.603675
Vanderbilt	0.406467	0.972033

-Florida has largest total enrollment of 60,795 (Fall 2024).

-Vanderbilt has smallest total enrollment of 13,575.

Conclusions

- Our analysis revealed a statistically significant but moderate relationship between college football success and fall enrollment, as seen through the Pearson correlation coefficient of 0.1977 and a p-value of 0.0005. While football performance, measured by wins, does impact enrollment, it is not the strongest predictor, with other factors such as academic reputation and facilities likely playing a role.
- Additionally, our K-Means Clustering analysis identified three distinct patterns among schools, where larger universities with higher win totals showed a clearer relationship between football success and enrollment increases. This aligns with the idea that greater resources and visibility at larger institutions drive both competitive success and potential enrollment growth.
- Overall, while football success contributes to enrollment trends, future studies could explore additional factors, such as academic quality improvements or the impact of upsets and star athletes, to gain a deeper understanding of the evolving role of athletics in higher education

References:

<https://www.sports-reference.com/>

All Enrollment numbers were extracted from each College website, by skimming the enrollment records and uploading those to an excel document.