**Introduction**

Every year the majority of the Big10 conference football teams participate in a bowl game. The determination to qualify for a bowl game is made through evaluating many statistics. This process can include a team’s regular season record, conference affiliations, or academic progress rate (Timanus). Looking at the Big Ten Football conference, I want to see what are some factors that influence or that contribute to a win at a Bowl Game and how attendance is affected after a bowl game. The factors that I will investigate are what conference the opponent is in, the year played, the day of the week played, which Bowl game they played in, the 2024 attendance, the 2023 attendance, and the average attendance in the last 5 years. Unlike regular season games that typically are played on weekends for, bowl games can be played on any day of the week. Many stadiums also have different capacities so looking at the percentages of fullness is an effective way to compare different teams.

Bowl game attendance is not something I am interested in investigating because of the location difference, regular season games are played in the college town or away at the opponent’s college town while bowl games are often played in a third-party location. By looking at trends in regular season attendance in the team’s home stadium I will be able to investigate the before and after trends in attendances in reflection to the result of the recent bowl games. Another thing to note is that because regular season games are played in the college town there could be higher attendance do to student population, cities moral for the team, or alumni coming back.

**Data**

Link to site for data scraping: <https://www.d1ticker.com/2024-fbs-attendance-trends/>

For my first source of data, I am scraping the table from the website D1.ticker. This table includes records from all NCAA schools on football attendances. These data points range from last year’s averages to averages from the last five years. The table included the following columns: School, Conference, 2024 Current Average, Week-over-Week % change, 2023 Average, Year-over-Year % change, 5 Year Average, 5 Year-over-Year % change, and Capacity %. This data is particularly relevant to my project as it gives the direct findings of attendance records. This data provides insight to the attendance records due to not only including one year’s attendance records but the past year as well as the 5 year average which can be compared to the teams winning records.

Link to Kaggle: <https://www.kaggle.com/datasets/maraglobosky/bowl-game-history-big10-football-may2024?resource=download>

My second data set comes from Kaggle. The data set contains records from the history of bowl games from teams in the Big10 conference. It has columns showing the opponent, scores, year, and day of the week played. This data set includes the columns: Year, Date, Day, Bowl, Winner/Tie, Pts, Loser/Tie, pts, Notes. This data provides days of the week that games were played on which ties into my analysis of how the day of the week affects some team’s performances. I can also use the points(pts) columns to track competitiveness of games. When looking at the amount of data collected, I have decided to not only investigate features of Big10 teams but also their opponents.

**Data Dictionary**

|  |  |  |
| --- | --- | --- |
| Winner/Tie | Text | College name of the bowl game winner |
| Loser/Tie | Text | College name of the bowl game loser |
| Winner Conference | Text | Conference that the winning team is from |
| Loser Conference | Text | Conference that the winning team is from |
| Year | Numeric | Year the bowl game was played |
| Date | Numeric | Date the bowl game was played |
| Day | Text | Day of the week the bowl game was played |
| Bowl | Text | Name of the Bowl game |
| Pts | Numeric | Number of points the winner scored |
| Pts.1 | Numeric | Number of points the winner scored |
| Winner 2024 Avg Attendance | Numeric | Regular season 2024 attendance average of winner |
| Winner 2023 Avg Attendance | Numeric | Regular season 2023 attendance average of winner |
| Winner 5 Yr Avg Attendance | Numeric | Regular season attendance average of winner of last 5 years |
| Loser 2024 Avg Attendance | Numeric | Regular season 2024 attendance average of loser |
| Winner 2023 Avg Attendance | Numeric | Regular season 2023 attendance average of loser |
| Winner 5 Yr Avg Attendance | Numeric | Regular season attendance average of loser of last 5 years |

**Proposed Analysis and Findings**

**Question 1:** Do Big10 teams tend to win the majority of bowl games?

I will make a pie chart showing select conferences winning and losing records from the last 5 years. I will then make a Word Cloud to visually display which conferences and teams are most frequently winning their bowl games.

A pie chart with a blue triangle

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A pie chart with text on it

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A pie chart with a blue triangle

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From the 3 pie chats above we can see the winning percentage of the Big10, the Big12 and the SEC. It is clear that the SEC has the most percentage of wins, followed by the Big10 and then the SEC. This information visualizes that the Big10 is not the most common winner of their Bowl games

A close up of text

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The word cloud above displays the conference team name largest to smallest according to percentage of wins among all observations. It is shown that the SEC, Pac12, and Big12 are the ones with the highest win percentage. This ranks the Big10 conference lower than most competing teams and they do not win the majority of the bowl games.

A close-up of words

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When viewing this word cloud, you can see that teams like Georgia and Alabama are the top winners of bowl games. Both of these teams are both part of the SEC conference. This shows that teams from the Big10 are not more likely to win their bowl games. This shows also depicts that not even the top 5 teams, those displayed the largest, are from the Big10. This shows that when a Big10 team is in a bowl game, the are not the most common winner.

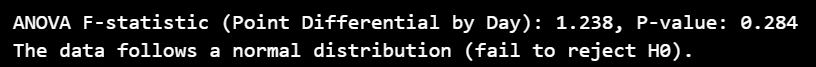
**Question 2:** Do certain days of the week correlate with better team performance or more competitive games?

To investigate this question, I will start with a bar chart showing the number of wins and losses on each day of the week and also use aggregation to collect summary statistics. I will then use the ANOVA test to compare the means of each day of the week. To measure competitiveness, I will use the point differential and the point total. After collecting that for each game I can run the same ANOVA test. This will be an exploratory question and analysis.

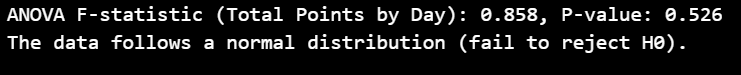
A graph of blue bars

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This bar graph shows the distribution of what days of the week the bowl games are played on. The most common day played on is Saturday, reaching 247 games. Following Saturday, the next most popular is Monday with 163 games. Lastly, Friday is the third popular day of the week, containing 151 games. It is also important to note that Sunday is the least popular day with 28 games. This low number makes sense because the NFL host most of their games on Sundays and if the Bowl games were also on Sunday it would interfere with their broadcasting. This data gives insight into the fact that the distribution of games over the week is not evenly dispersed, meaning it could have an influence on a team’s competitiveness.



This first ANOVA test determines the significance of the day of the week played to the point differential between the winning and losing team of a particular game. It is shown that there is a significant difference between what day a game is played and the range between the winners and losers score.



I also measured competitiveness by total points scored in a game. Preforming this second ANOVA test confirmed that the day of the week played had a statistically significant impact on the total points scored in a game. In both ANOVA tests the null hypothesis was that there is no significant difference and, in both ANOVA, tests the null hypothesis was rejected.

**Question 3:** Does winning a bowl game lead to changes in attendance the following year?

To investigate this question, I will use summary statistics of the Capacity %. I will also be constructing a box plot to compare median attendance. I can then make a bar plot displaying the differences between attendance change from 2023 to 2024 and label them according to if they had a bowl game win or lose. I can then perform a t-test to see if the previous bowl game win is statistically significant to a positive change in attendance.

My proposed hypothesis would be that bowl game wins are statistically significant to influencing average attendance for a team’s next season.

A graph of a number of people

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A graph of a number of people

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From comparing the two bar charts above it is clear that there is no difference between the change in attendance from winning teams and losing teams. Both graphs follow a normal distribution, and it does not seem as if there is a stronger increase in attendance for teams that have won their last game. It also seems there is not a strong decrease in attendance for teams that have lost their last game.

A graph of a comparison of a number of blue squares

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This box plot further shows the similarities in attendance between the average attendance for winning teams in 2023 and 2024. There is a slight increase in the 25 percentile from 2023 to 2024 but all other markers appear consistent. This increase can be tested to see if it is significant to a team previously winning a 2023 bowl game. Other considerations that could impact this result is the stadium capacity and/or renovations that could increase capacity.



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My proposed hypothesis would be that bowl game wins are statistically significant to influencing average attendance for a team’s next season.

**Conclusion**

This project’s goal was to analyze the performance of Big10 football teams in bowl games, the influence of day of the week played on competitiveness, and whether a bowl game win impacts future regular-season attendance. Through visualizations and statistical analysis, several conclusions emerged. First, Big10 teams do not win the majority of their bowl games. Conferences like the SEC and Pac12 have higher win rates, with the teams Alabama and Georgia dominating outcomes. Second, the day of the week on which a bowl game is played appears to influence game competitiveness, as both point differential and total points scored showed statistically significant differences across weekdays. Lastly, contrary to expectations, winning a bowl game did not show a significant correlation with an increase in regular-season attendance the following year.

There are several limitations to this study. One limitation is the assumption that attendance trends are primarily driven by bowl game results. Factors like changes in coaching staff, player recruitment, weather, local economic conditions, or stadium renovations were not controlled for but could have an effect on attendance. Another limitation is the variability of bowl game opponents, which may influence competitiveness and win likelihood, which was a factor not considered in analysis.

Future research could explore these additional variables more closely, especially those influencing attendance beyond just win/loss outcomes. Moreover, expanding the dataset to include more seasons could provide a broader context and allow for deeper insights. Investigating fan engagement through ticket sales, social media trends, and regional loyalty metrics may also provide a better understanding of post-bowl game attendance behavior.

Sources

*2024 FBS attendance trends: College Athletics News: D1 ticker*. D1.ticker | Eliminate the barrage of articles and time-consuming searches. Efficient D1 athletics news in a daily email. (2024, December 2). <https://www.d1ticker.com/2024-fbs-attendance-trends/>

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Timanus, E., & Myerberg, P. (2020, October 14). *Get ready teams with losing records in bowl games after NCAA waives win requirement*. USA Today. <https://www.usatoday.com/story/sports/ncaaf/2020/10/14/ncaa-waives-college-football-bowl-win-eligibility-requirement/3656916001/>

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