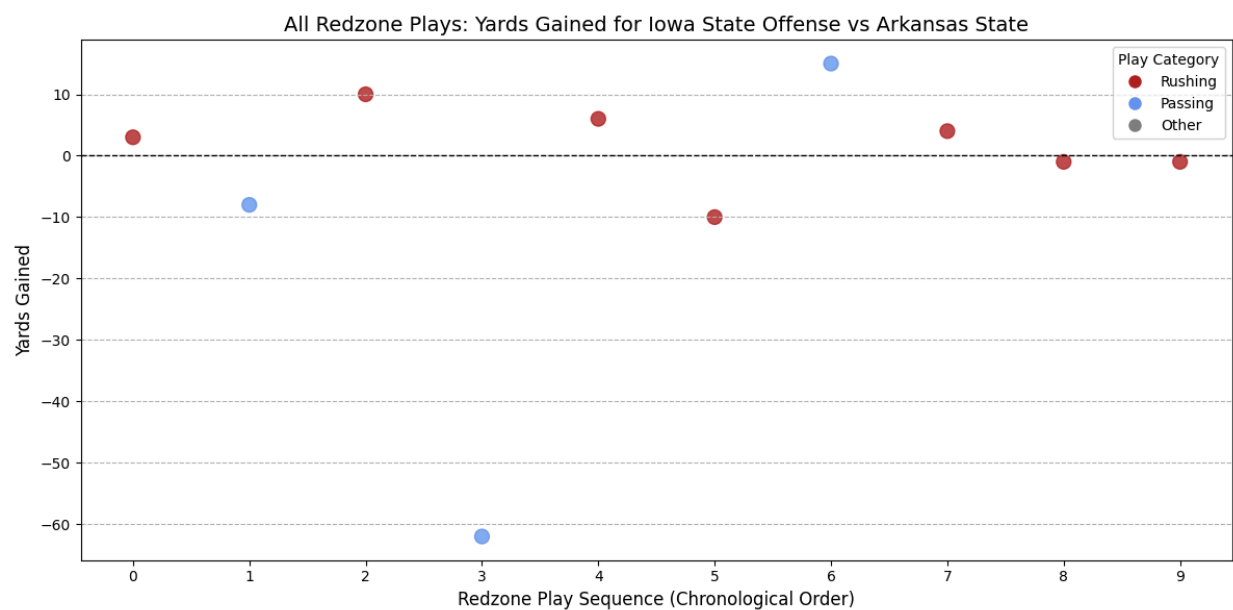
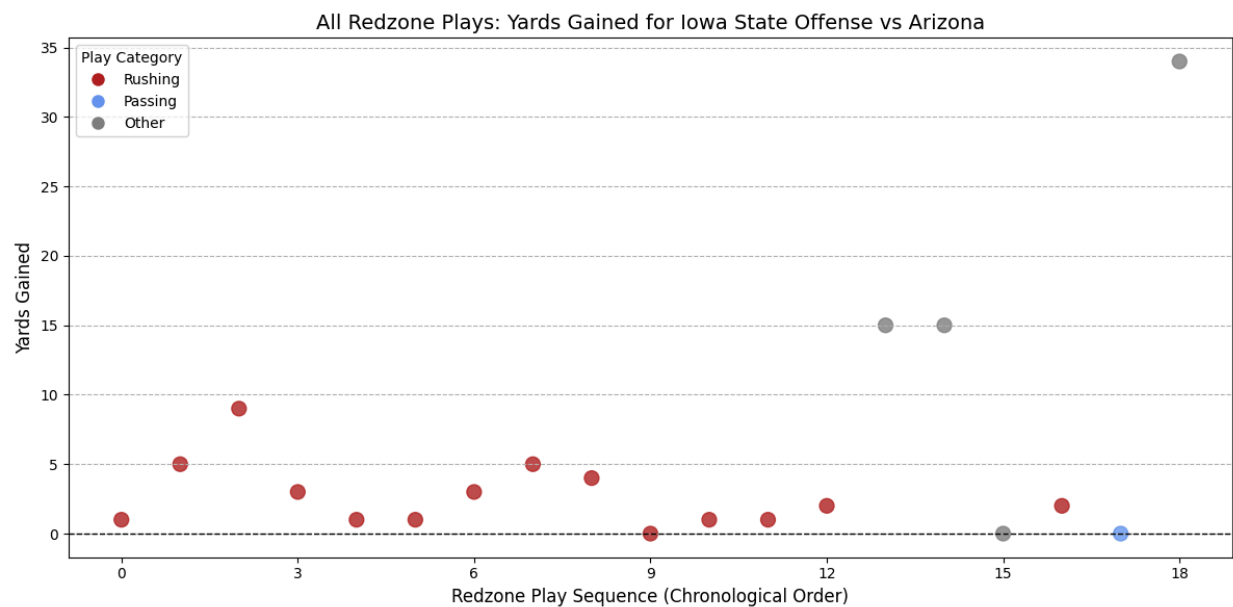


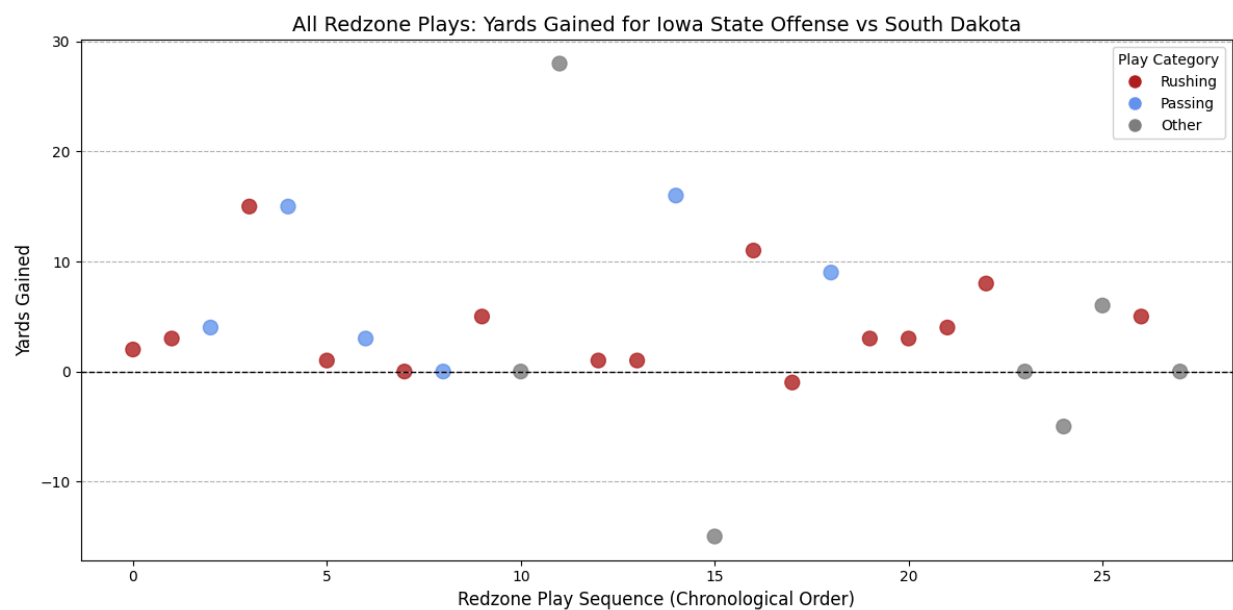
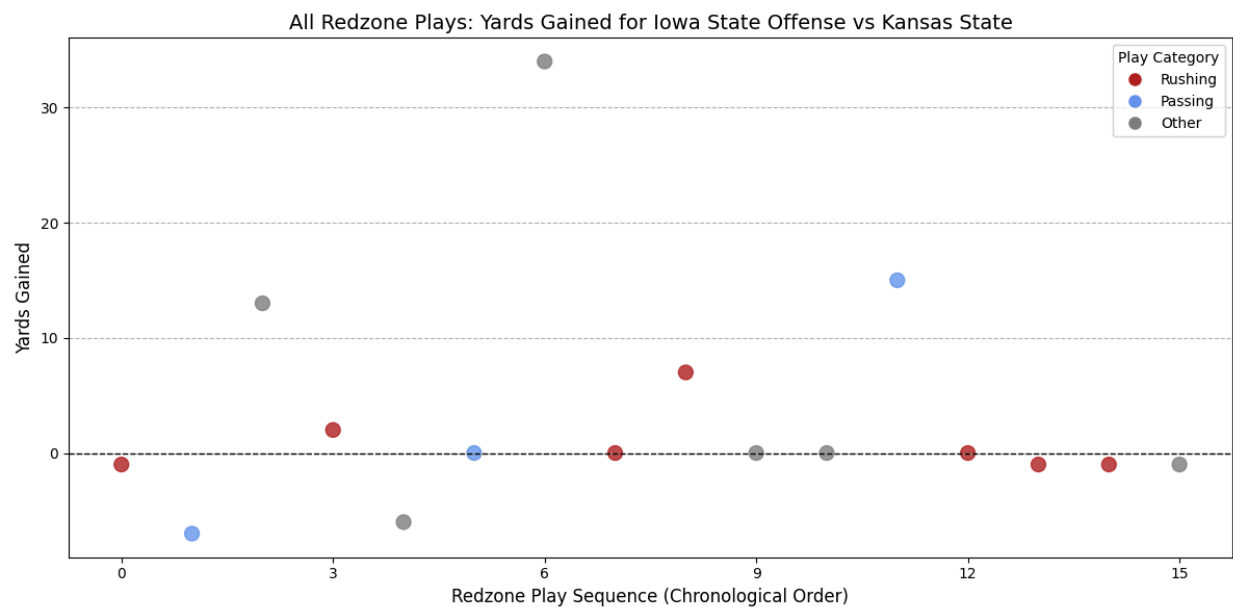
# Report

# ISU Football Data Analysis

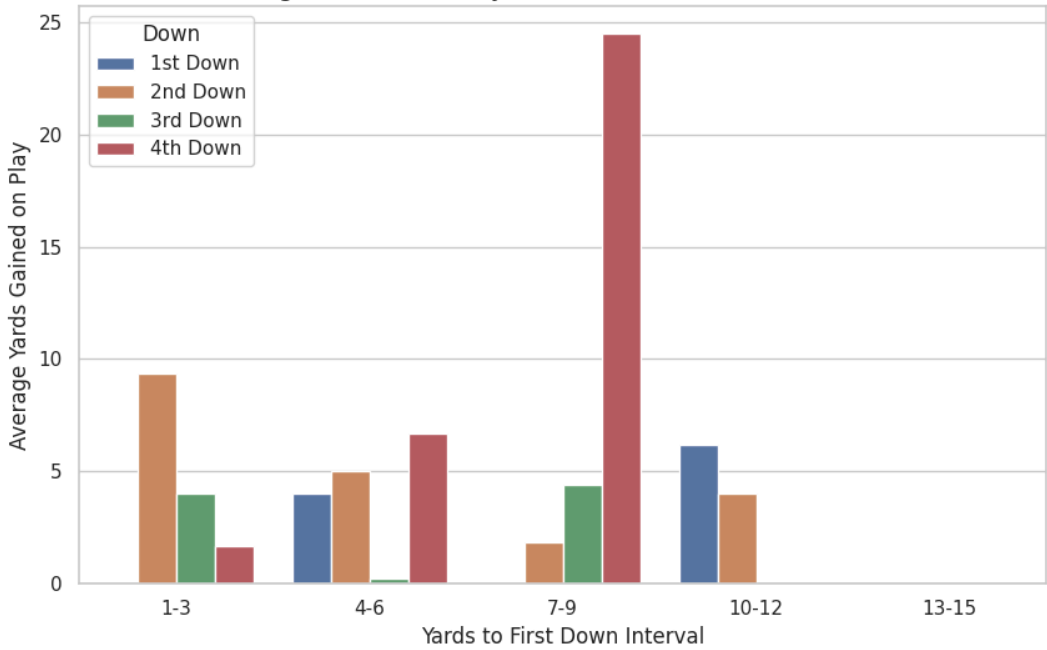
*By: Malachi Taylor, Jacob Gunderson, Andrew Kruger, Julian Mathew,  
Patrick Adduci, Luke Randolph, Sawyer Chopskie*

# Graphs

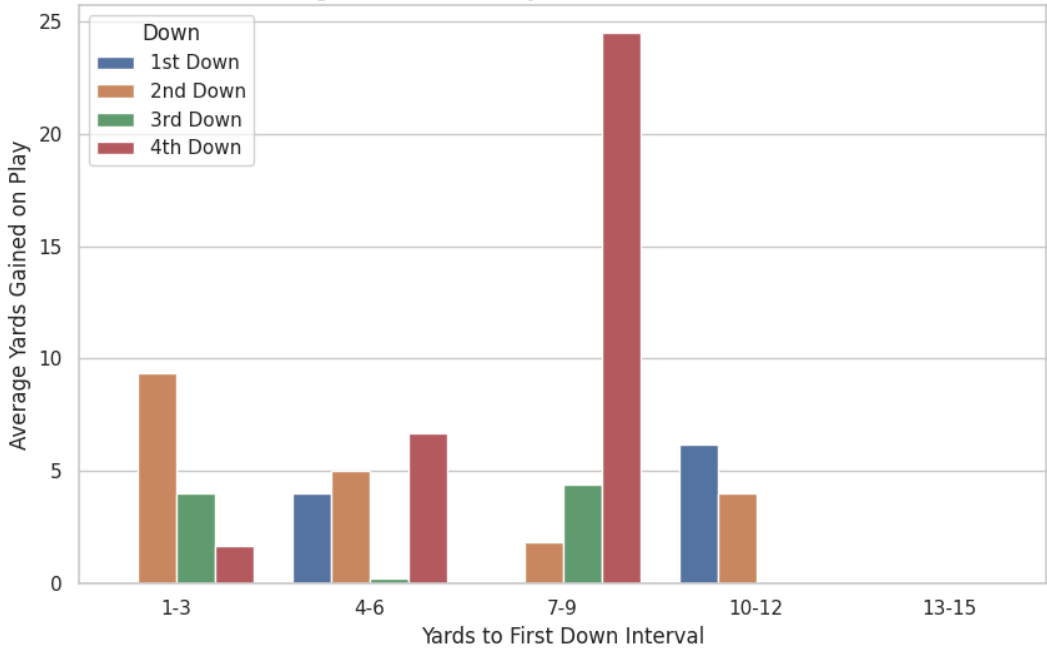




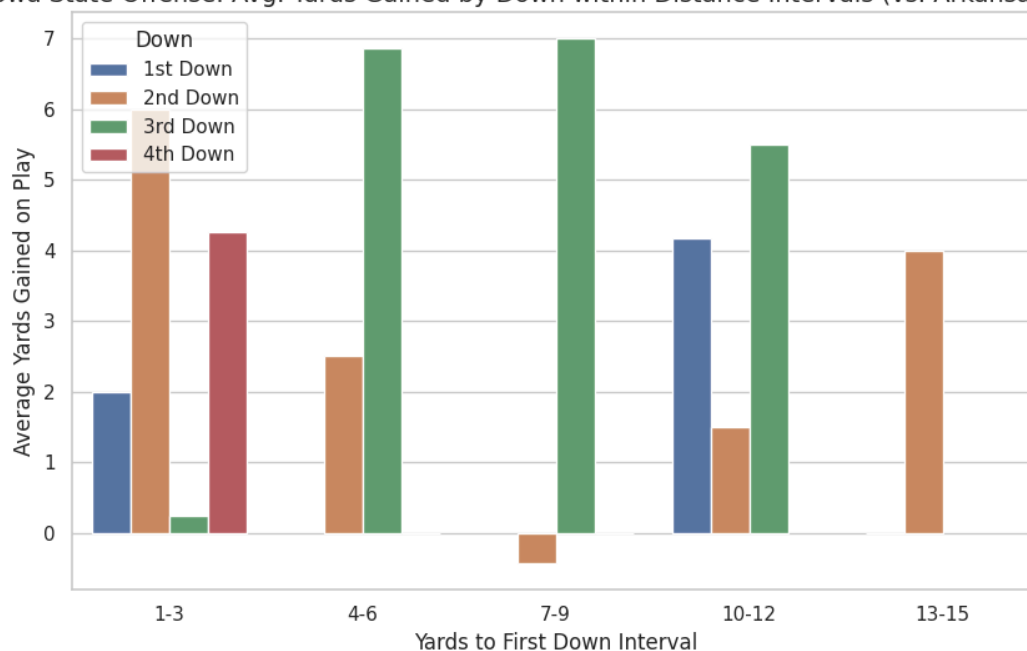
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Arizona State)



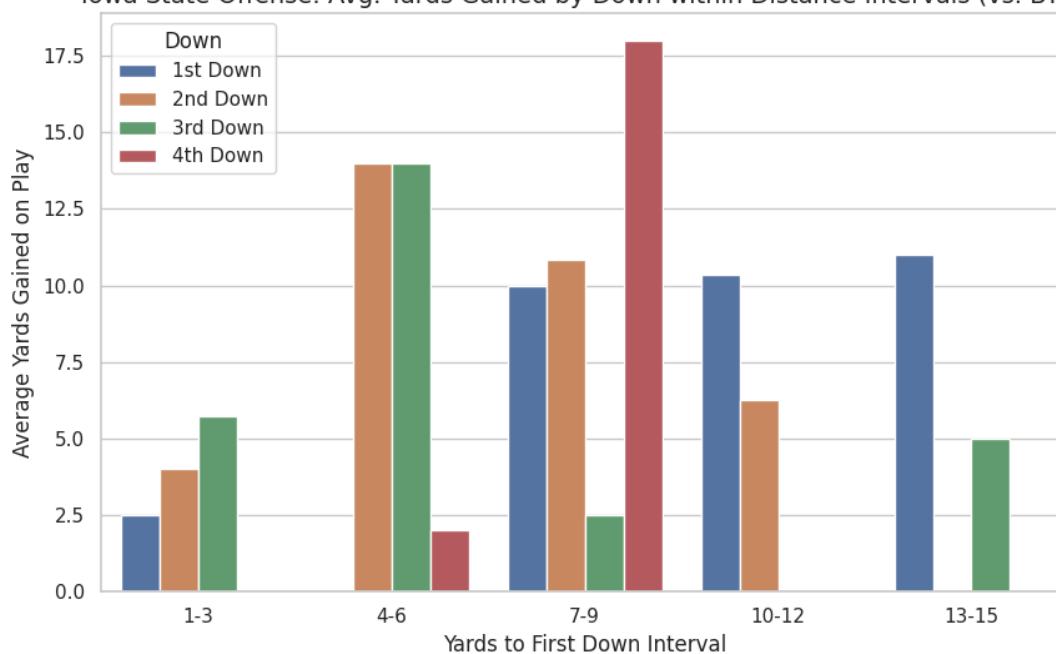
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Arizona)



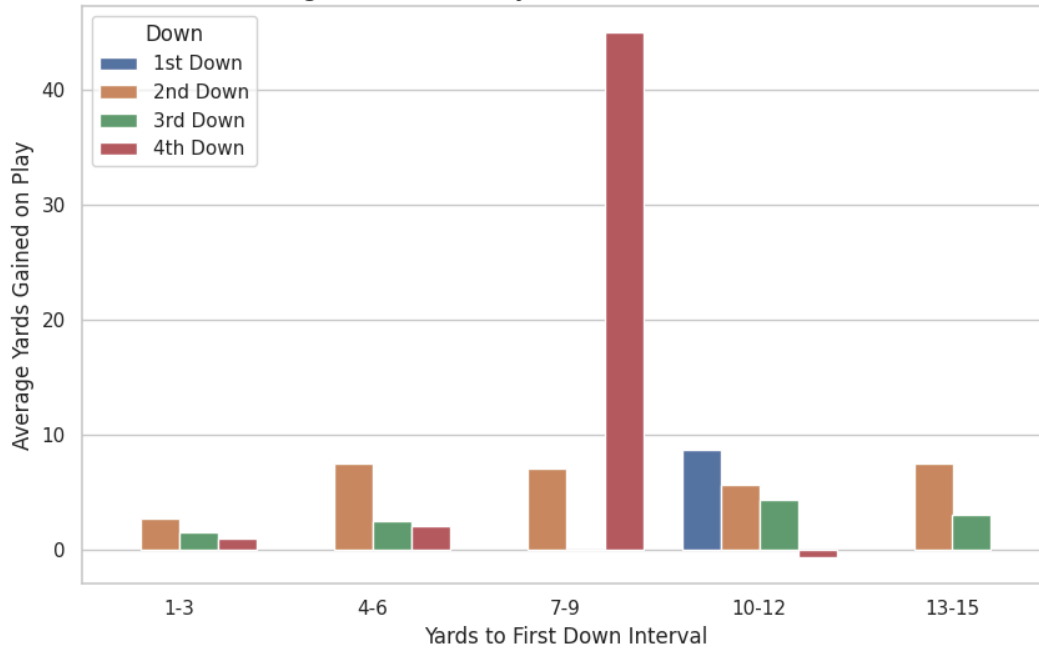
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Arkansas State)



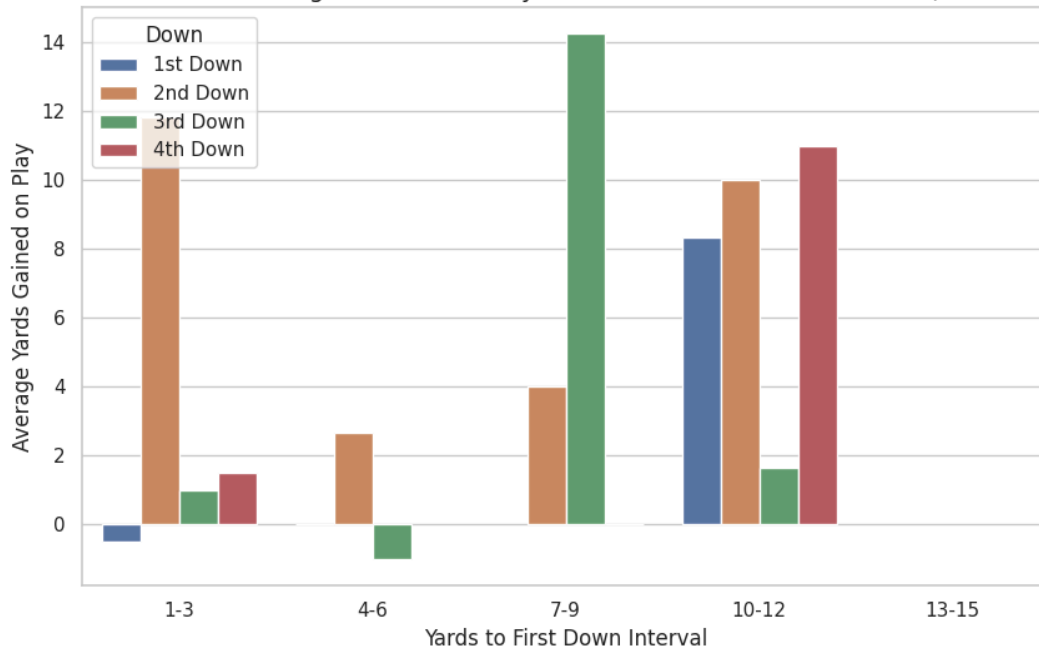
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. BYU)



Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Cincinnati)

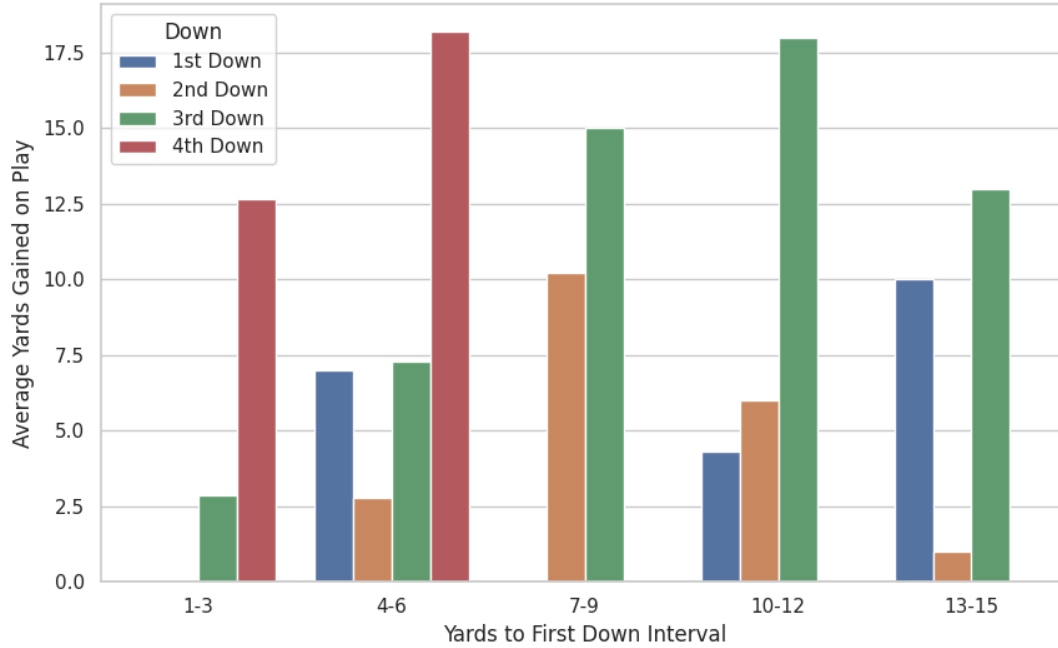


Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Colorado)

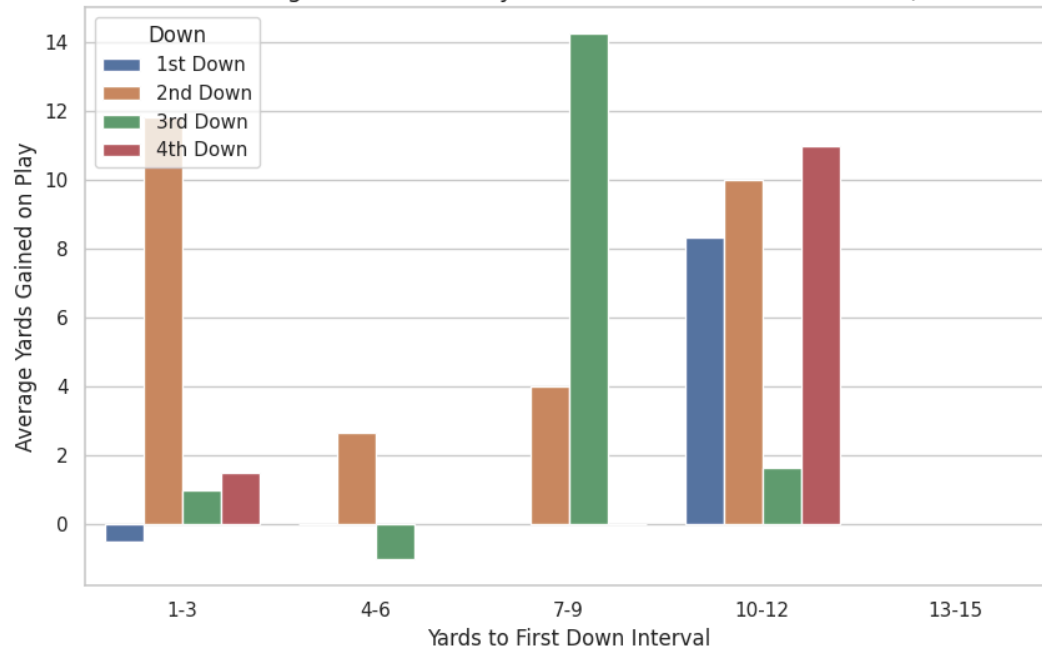




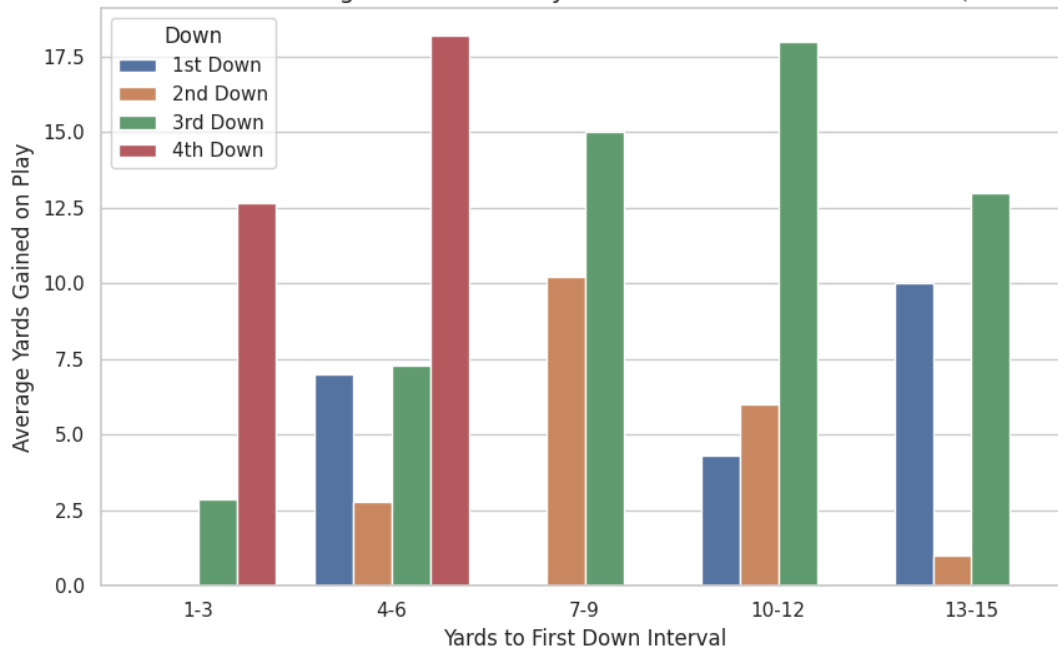
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Iowa)



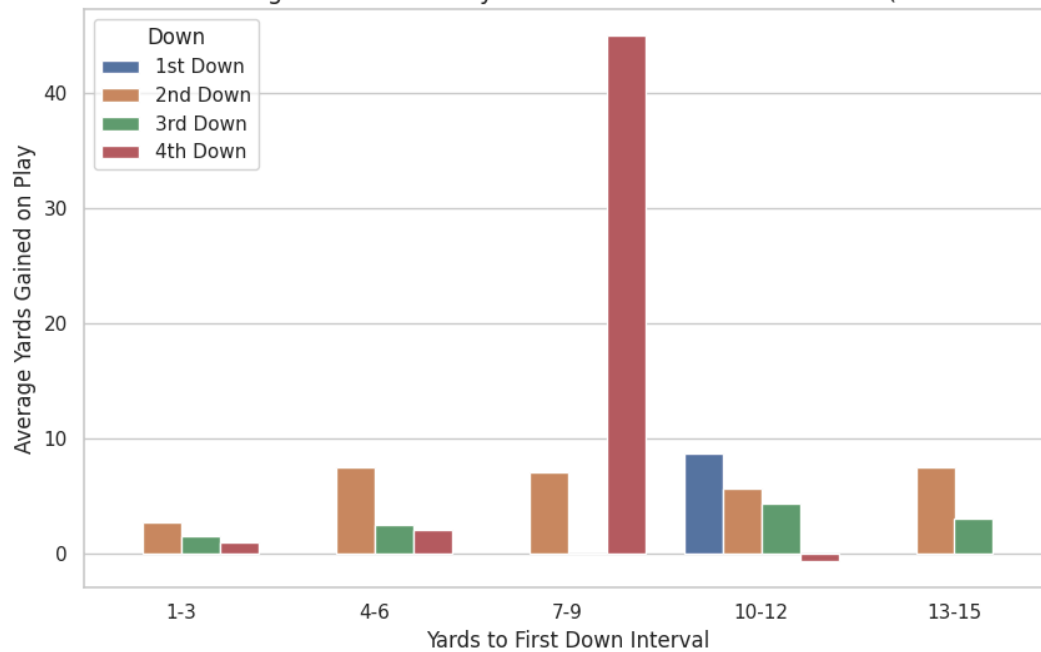
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Kansas State)



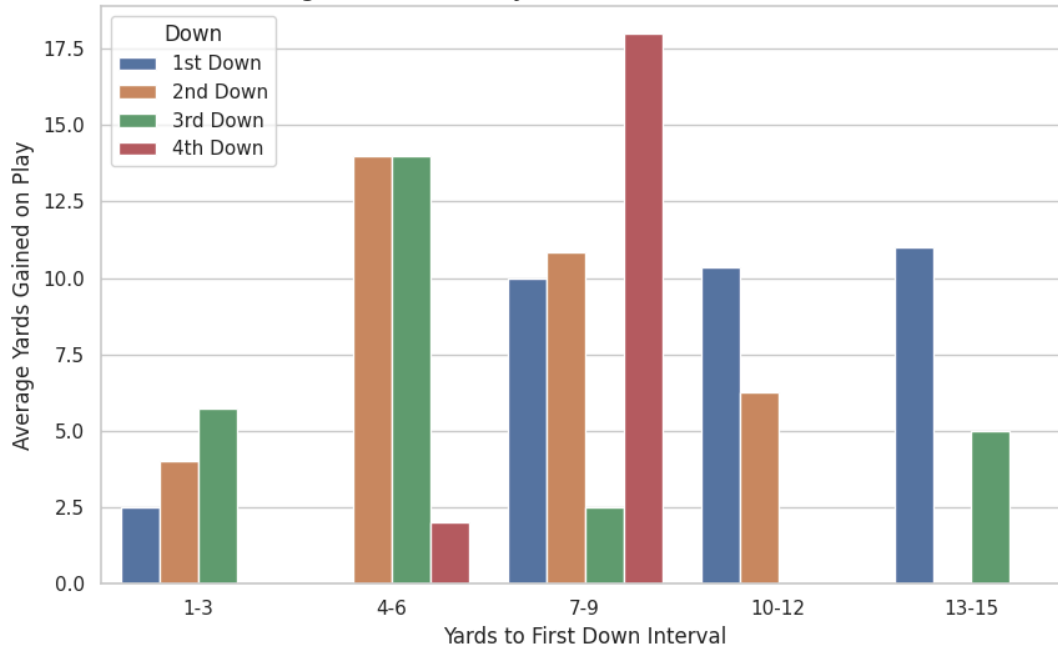
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Kansas)



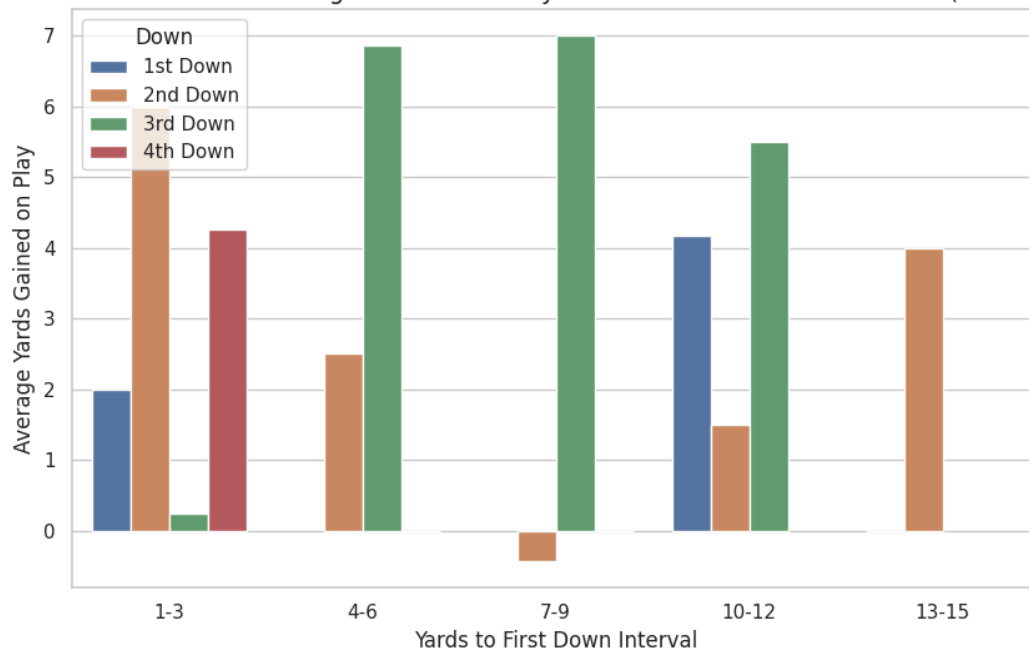
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Oklahoma State)

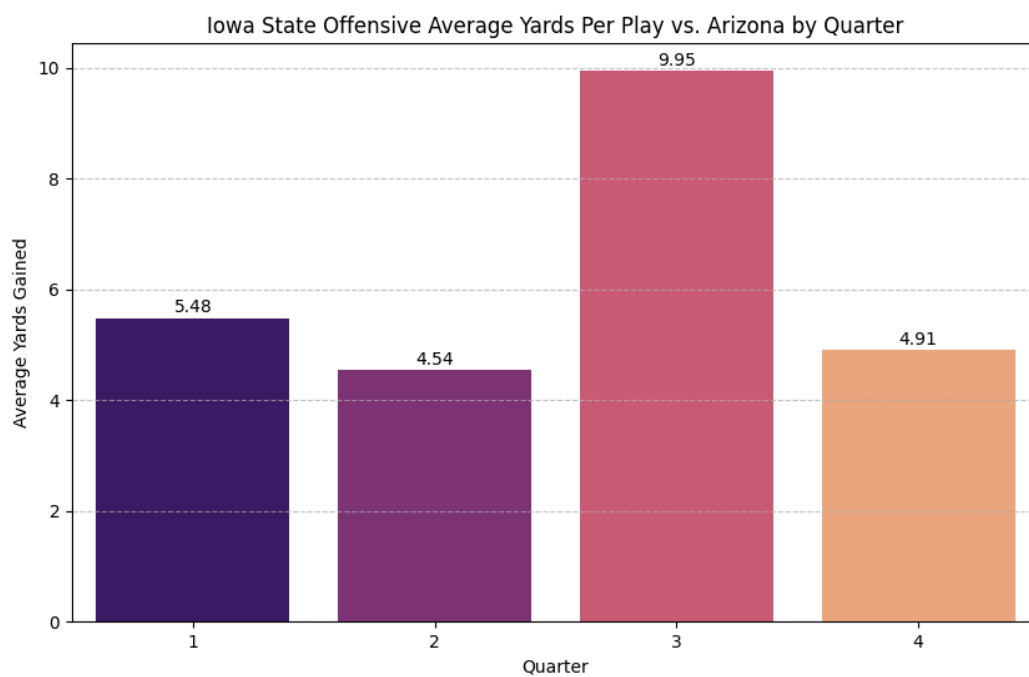
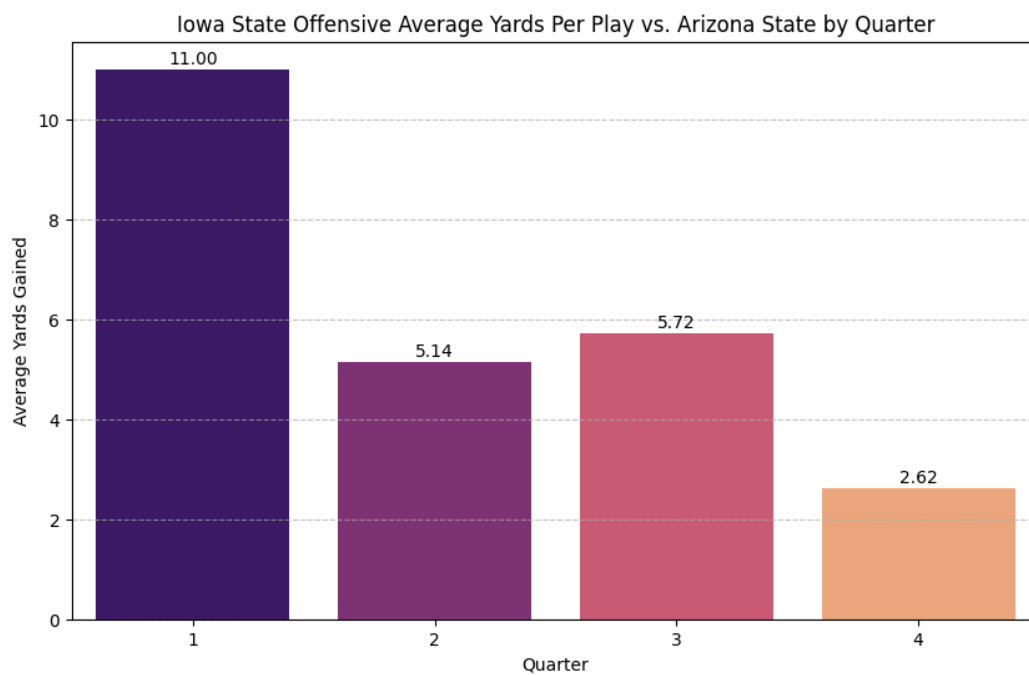


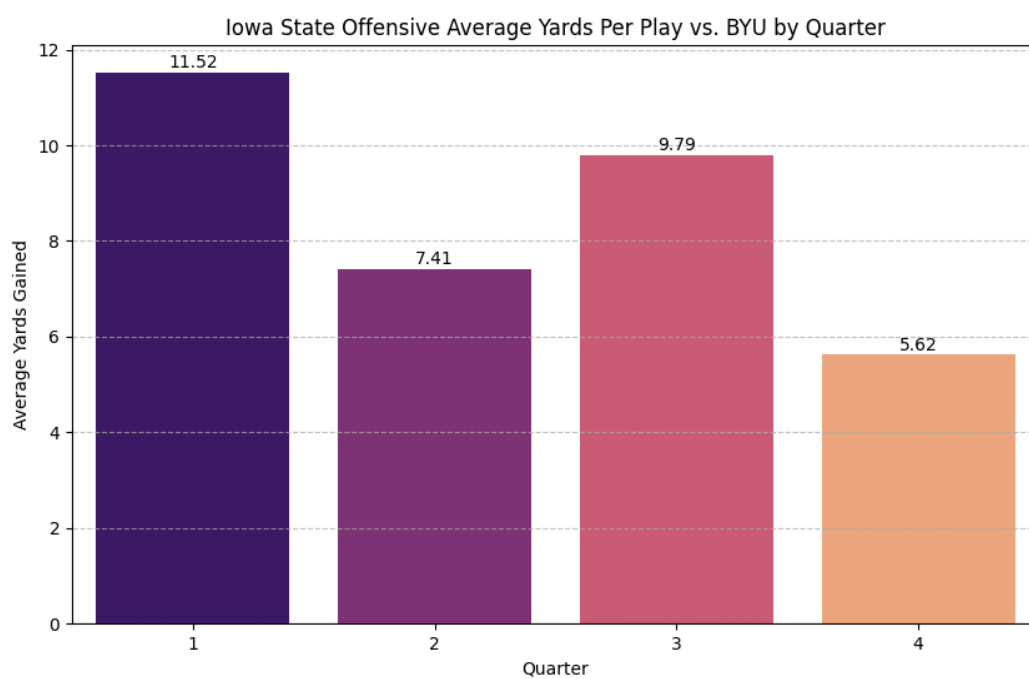
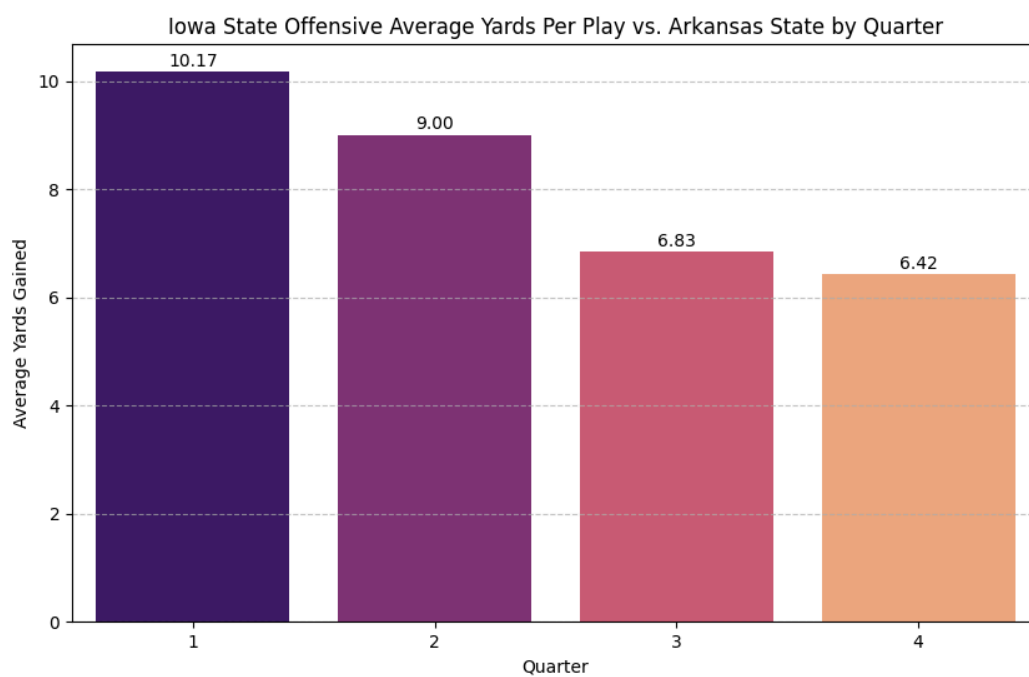
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. South Dakota)

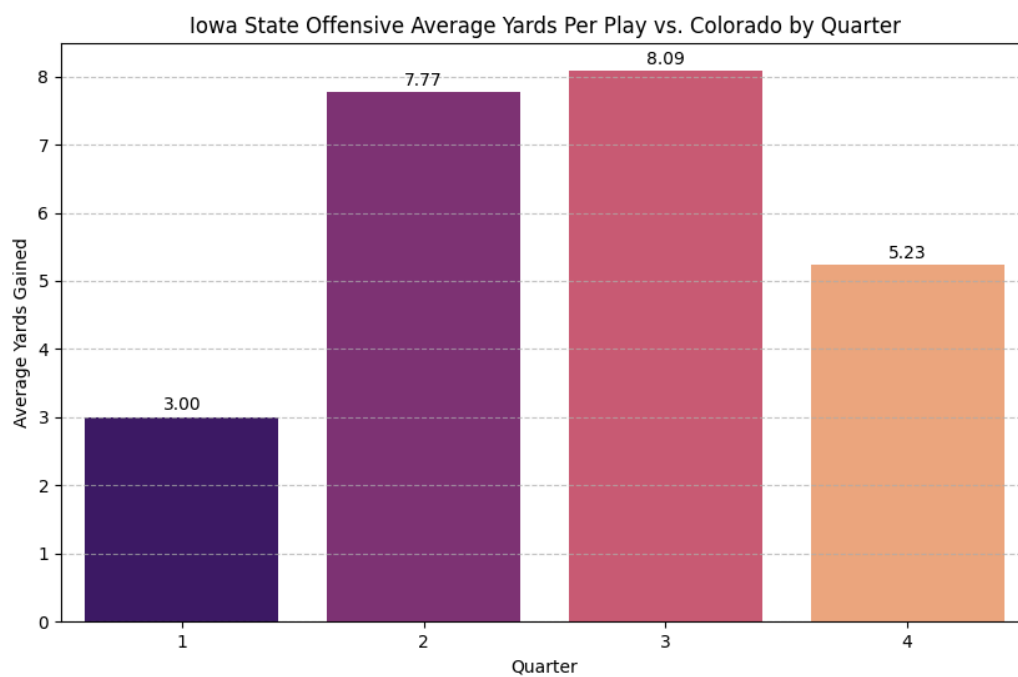
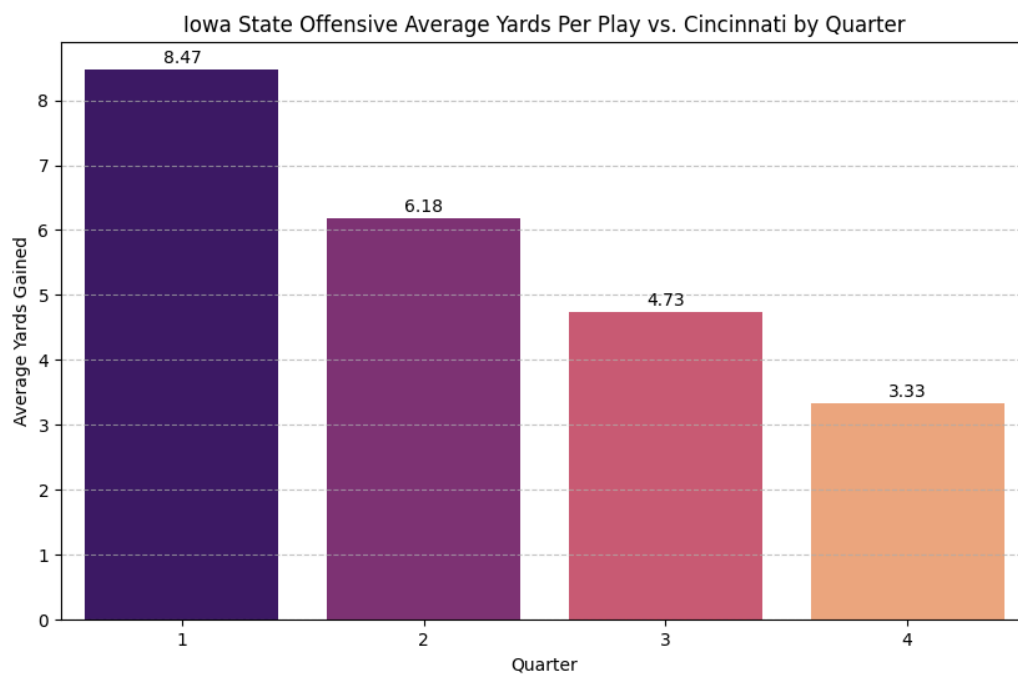


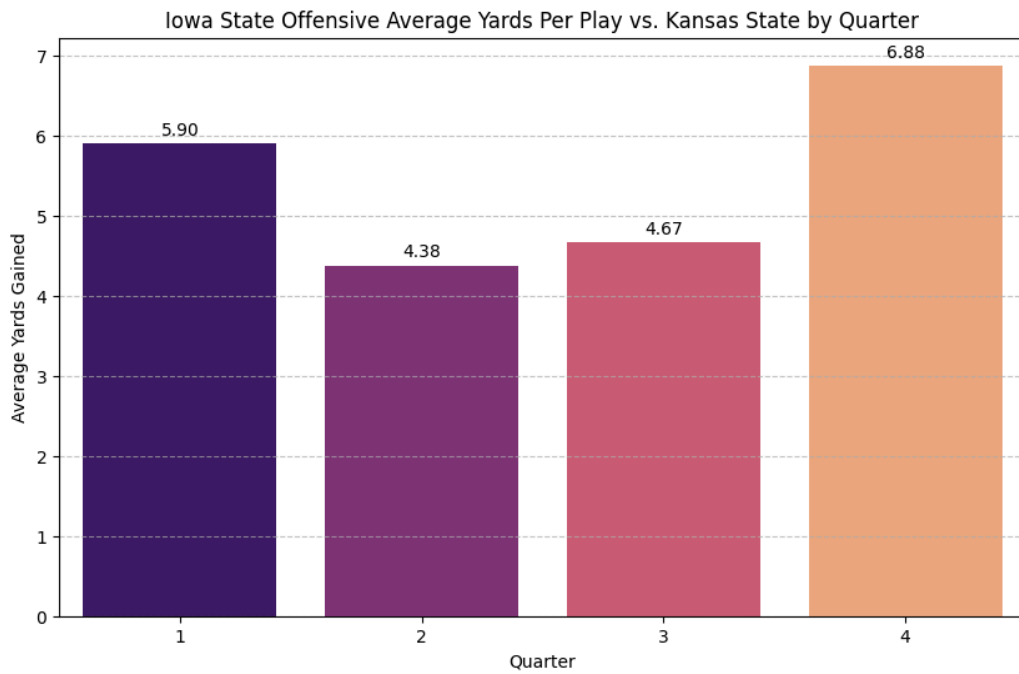
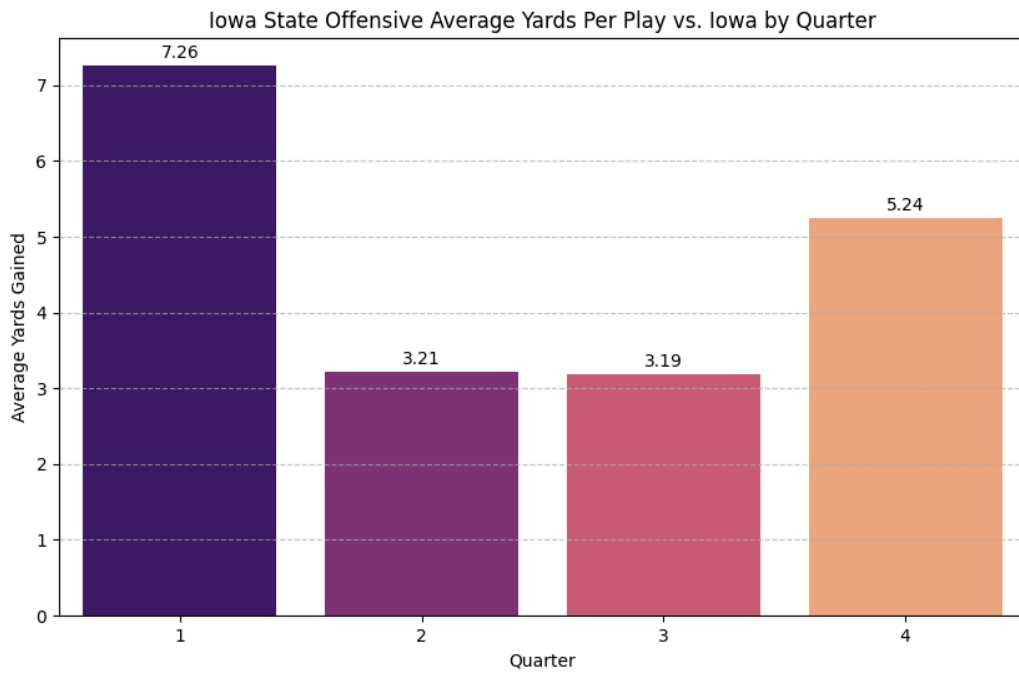
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. TCU)

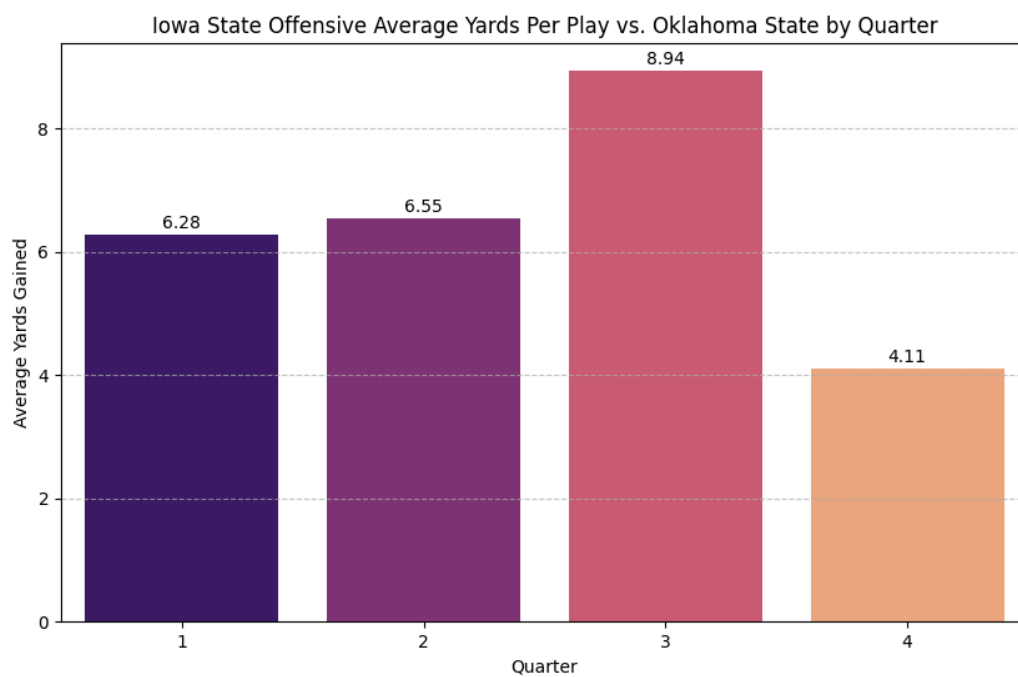
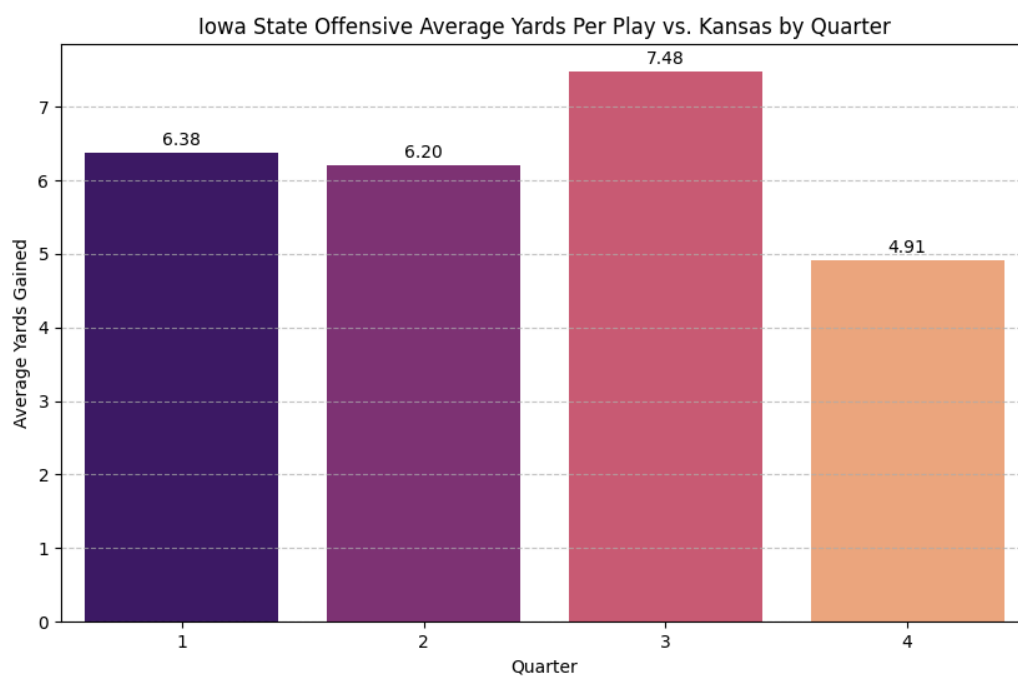




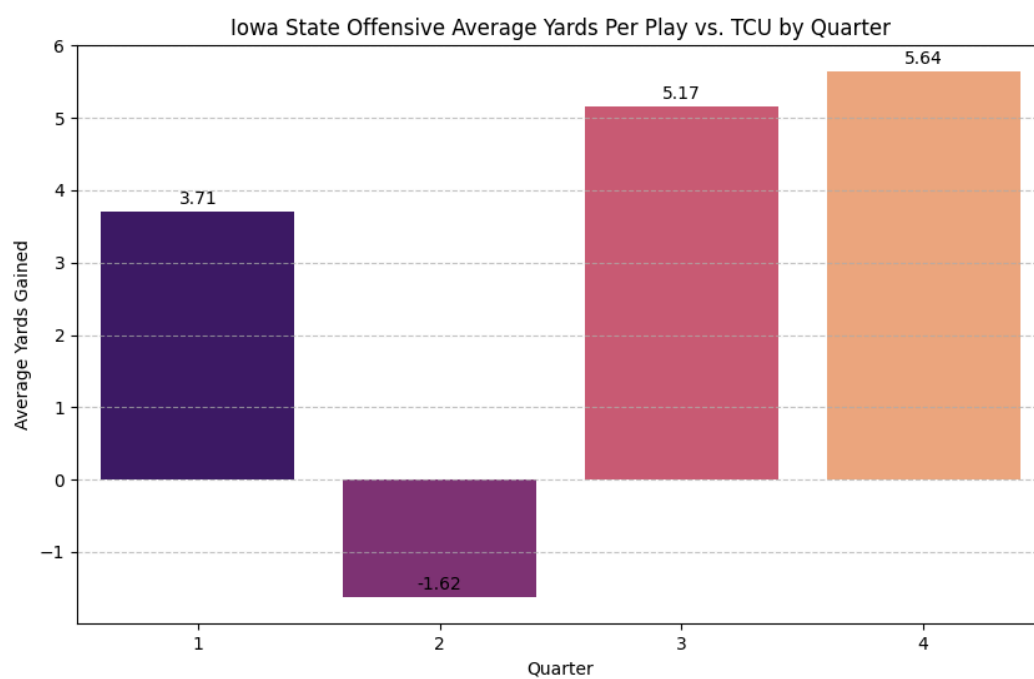
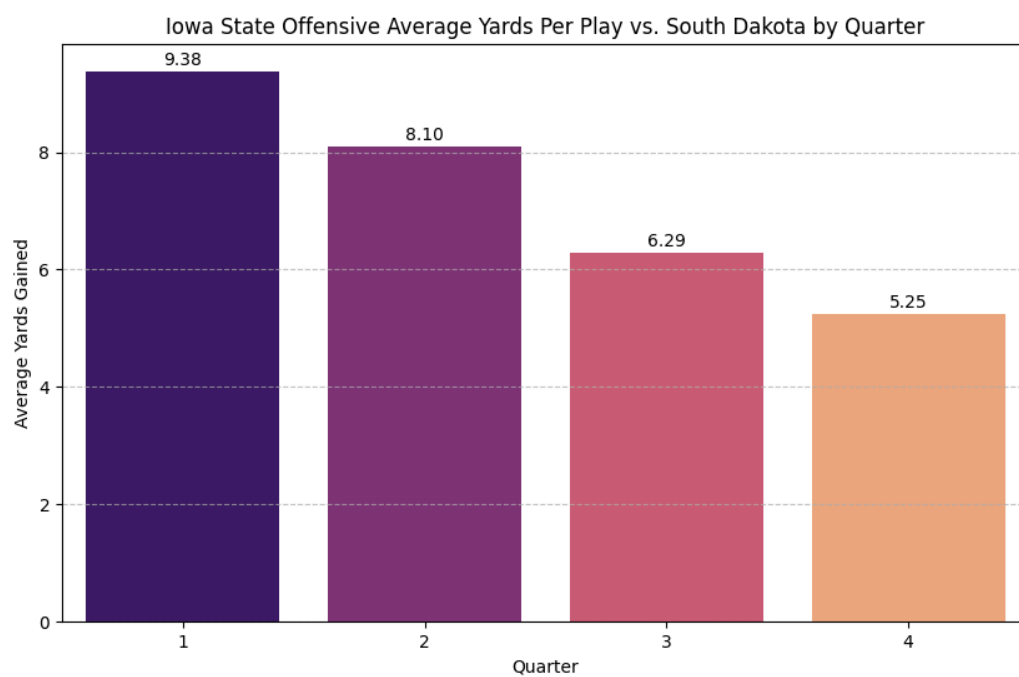




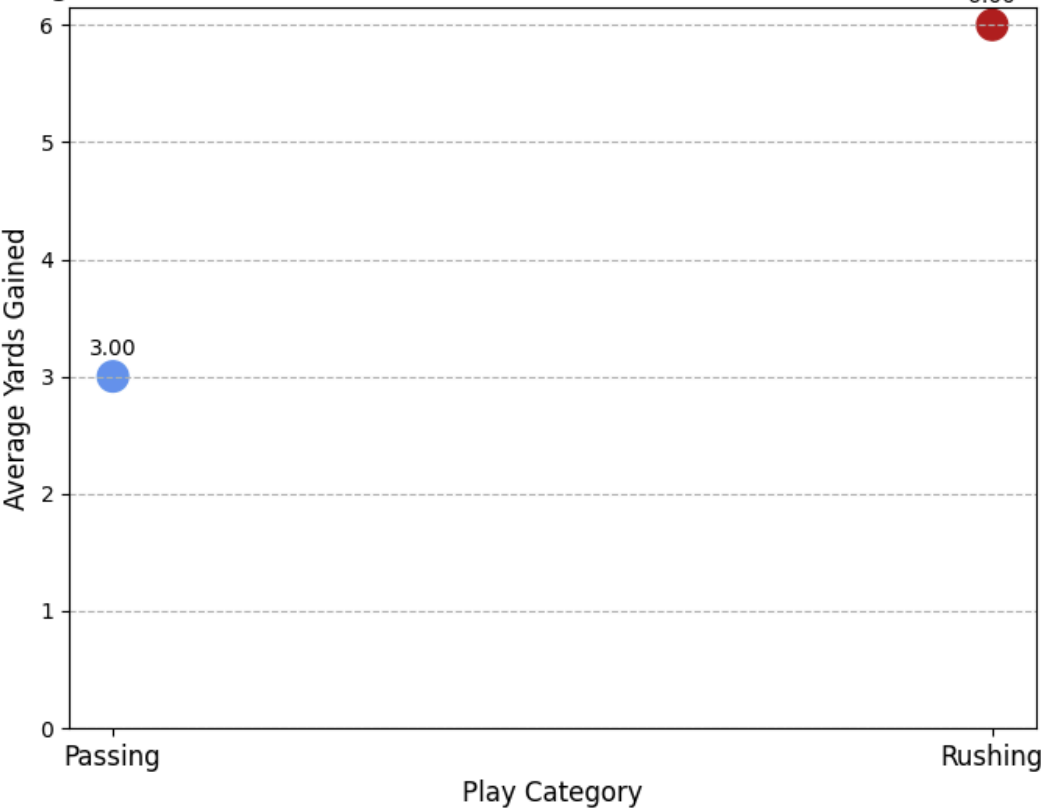




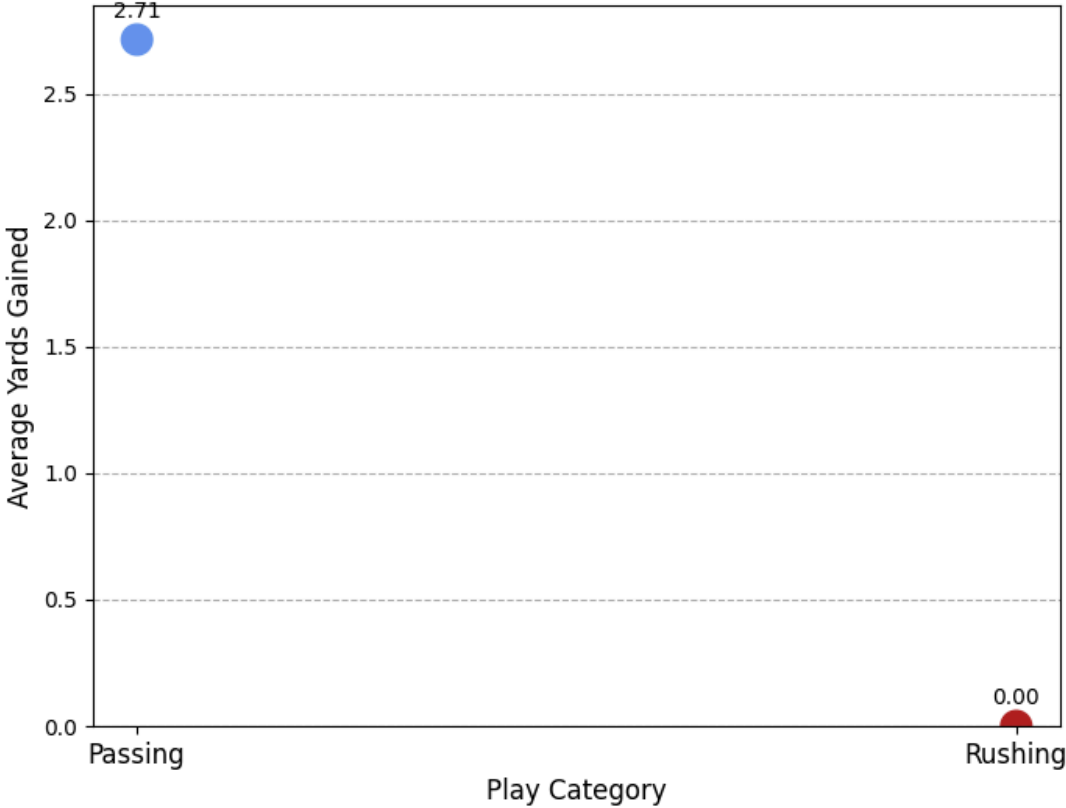




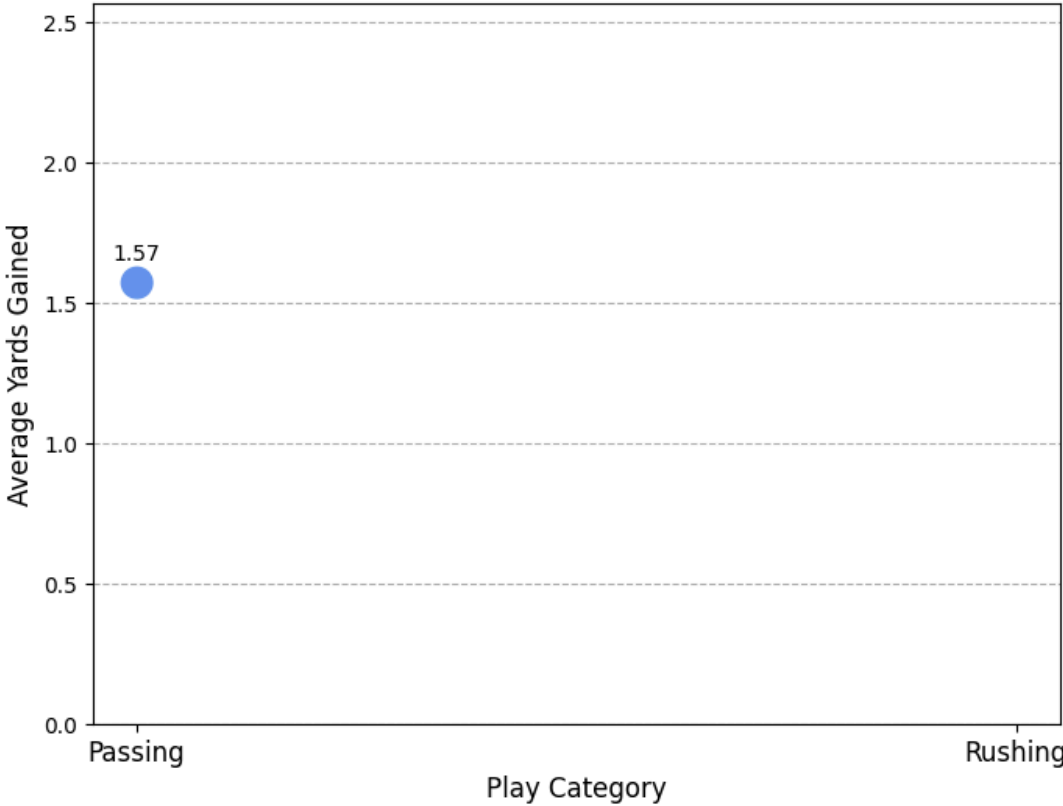
Average Yards Gained in the Redzone for Iowa State Offense vs Arizona State



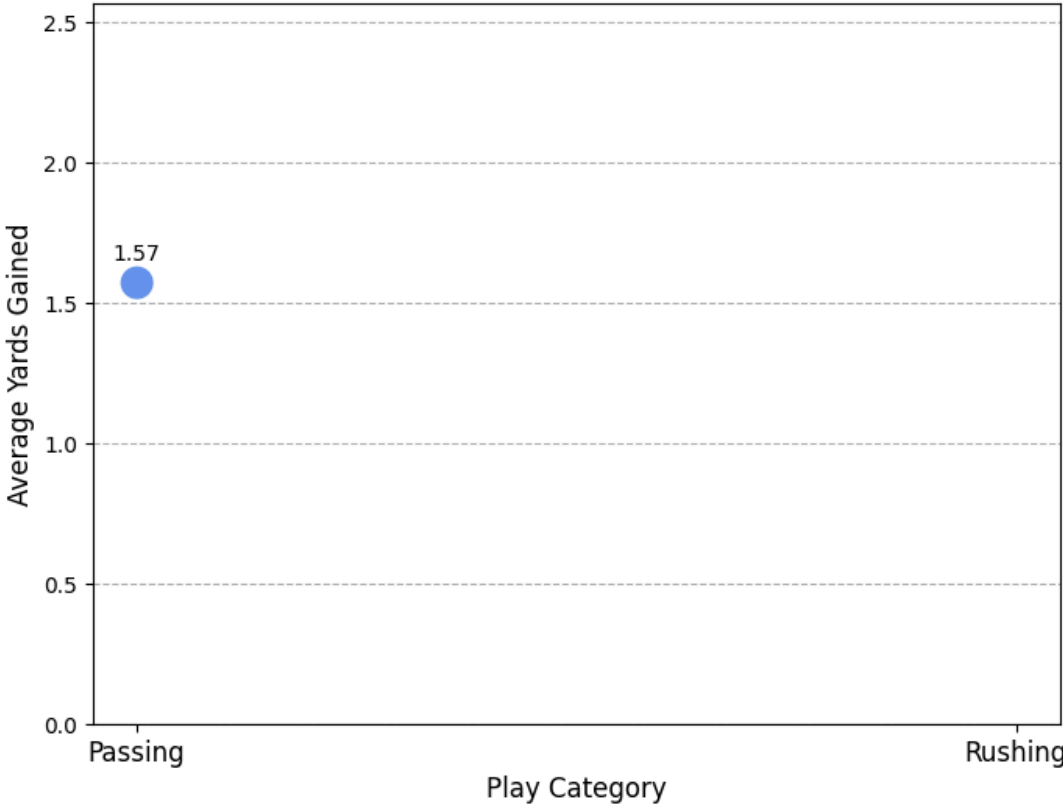
Average Yards Gained in the Redzone for Iowa State Offense vs Arizona

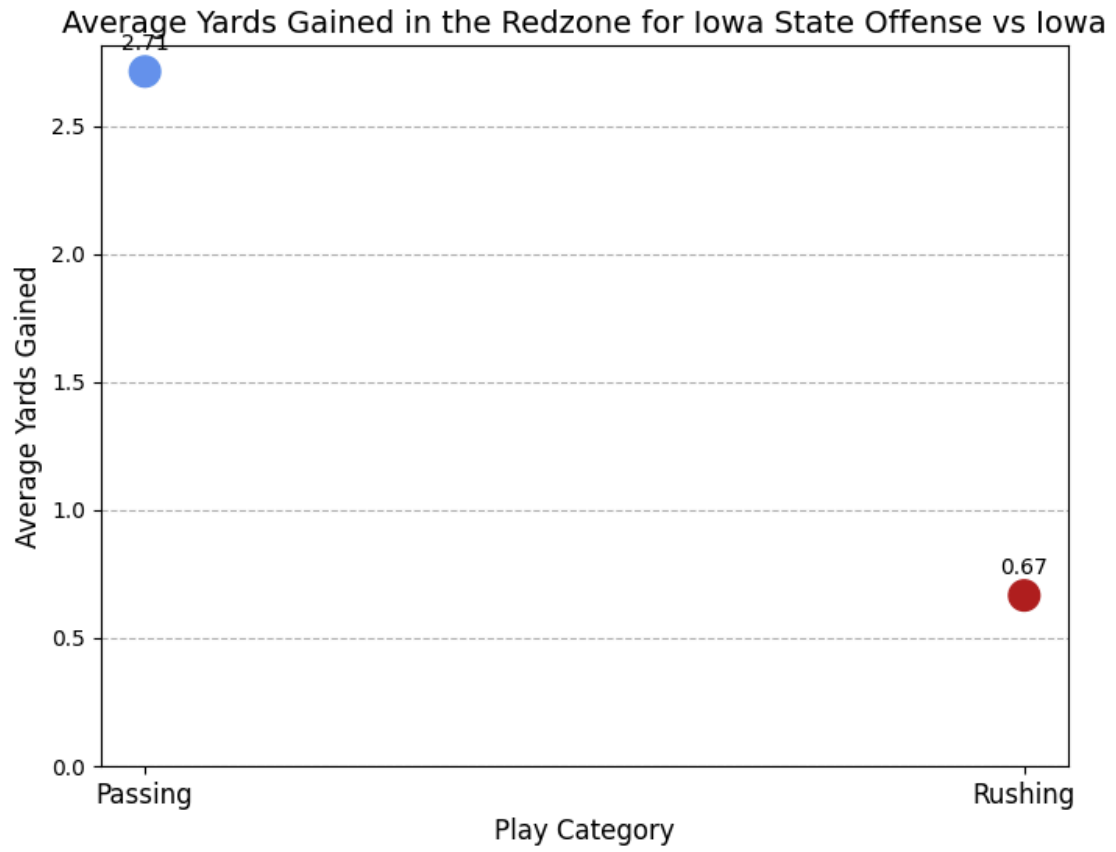


Average Yards Gained in the Redzone for Iowa State Offense vs Arkansas State

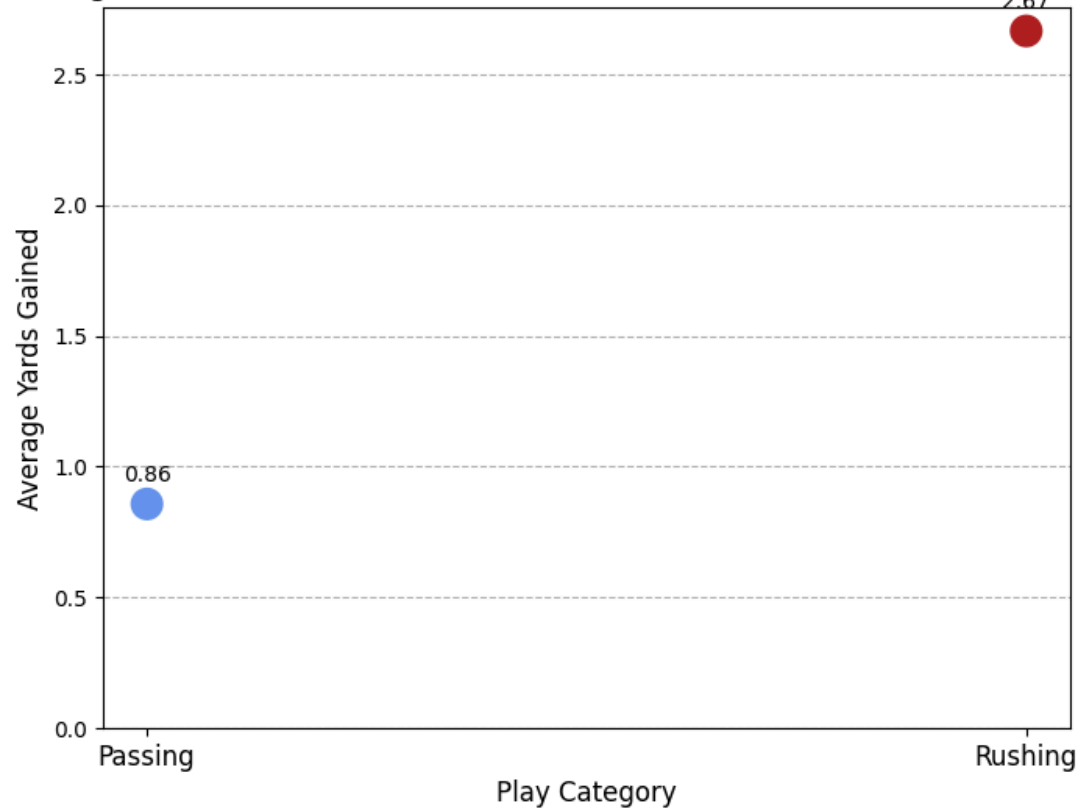


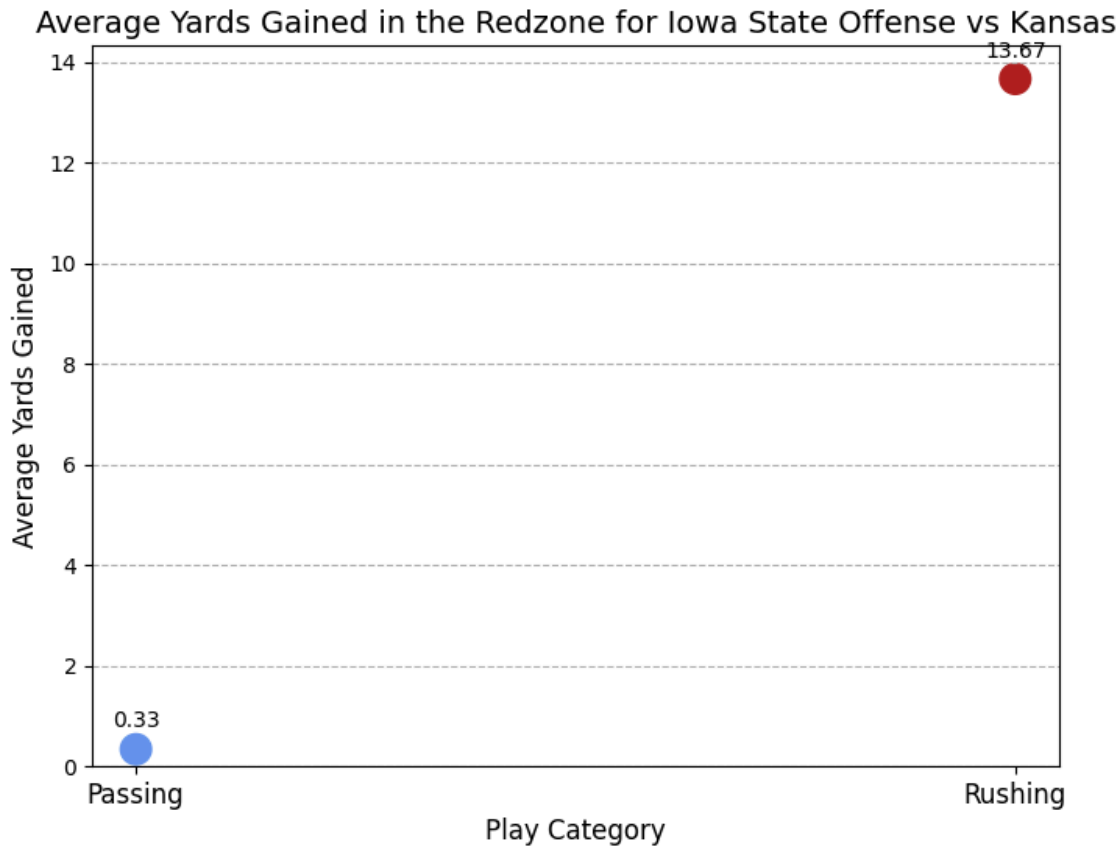
Average Yards Gained in the Redzone for Iowa State Offense vs Arkansas State





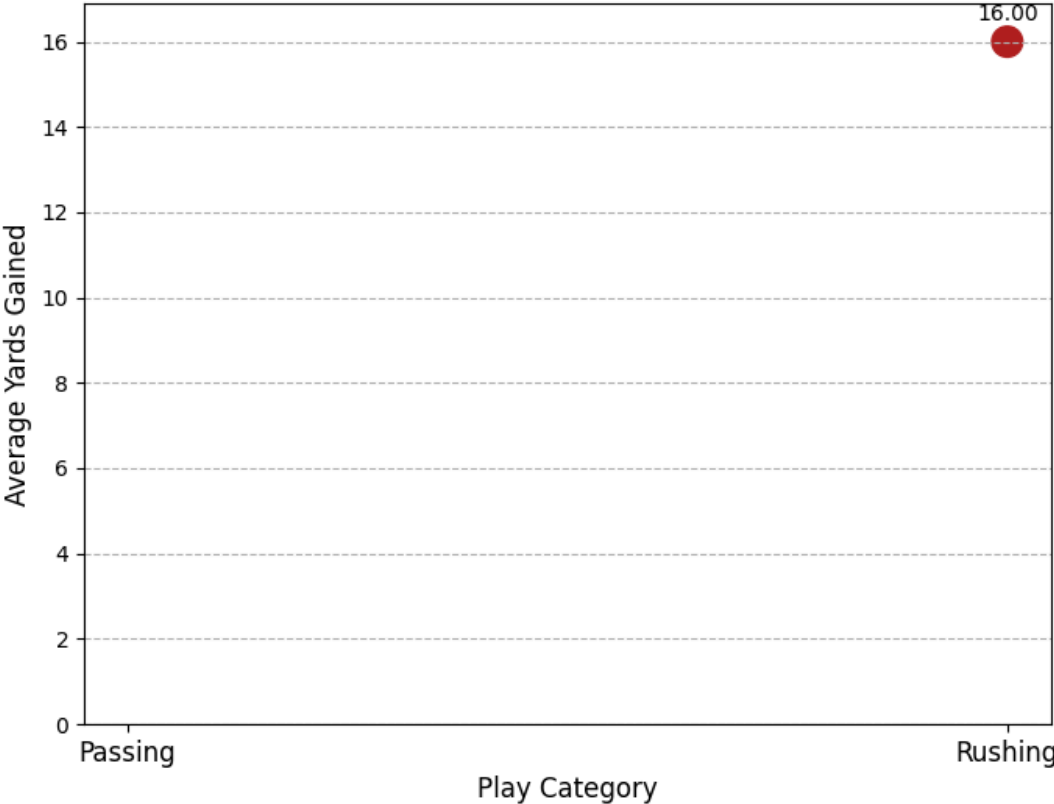
Average Yards Gained in the Redzone for Iowa State Offense vs Kansas State



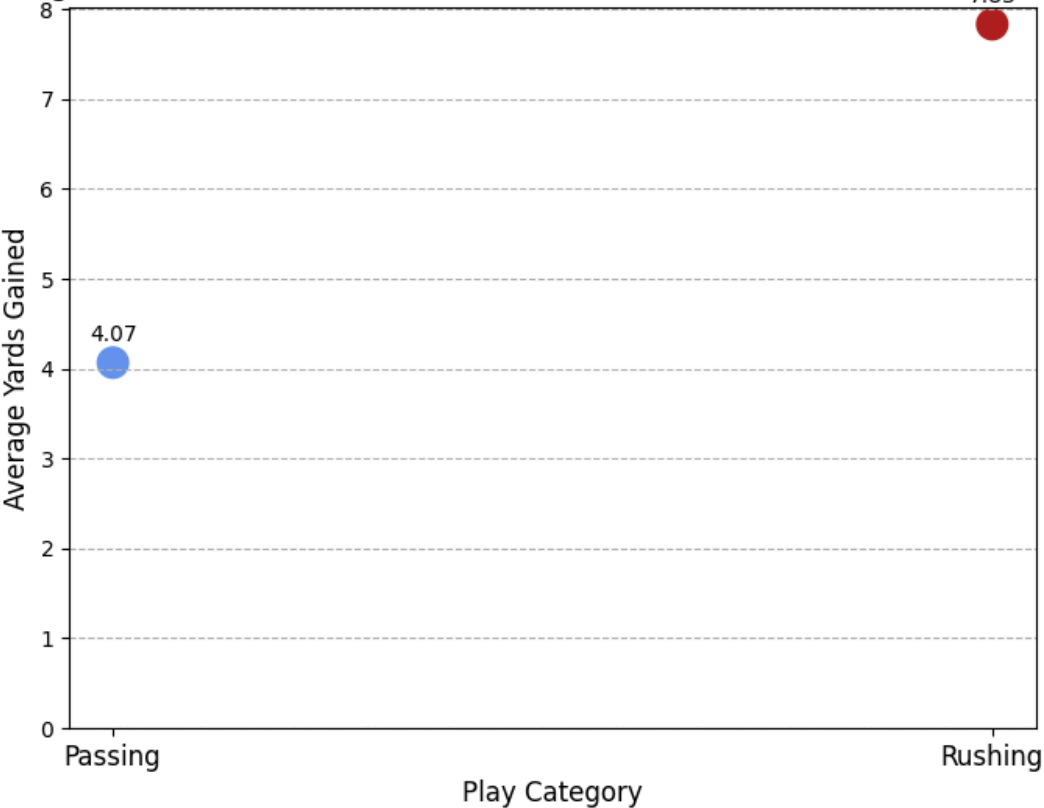


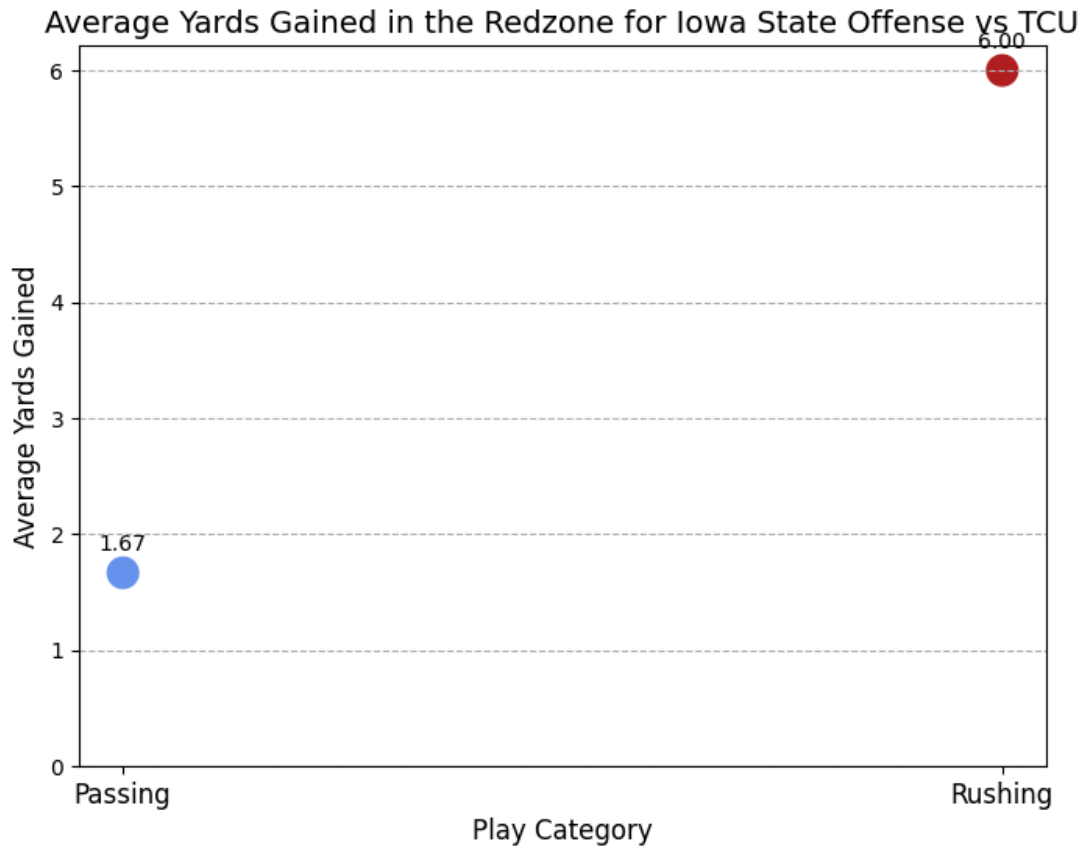


Average Yards Gained in the Redzone for Iowa State Offense vs Oklahoma State

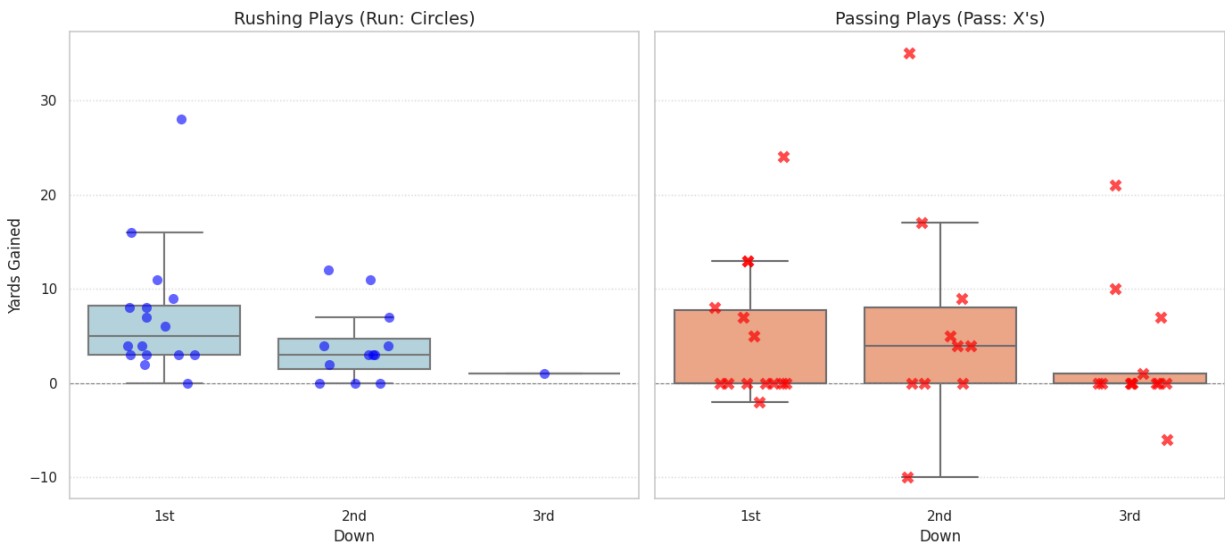


Average Yards Gained in the Redzone for Iowa State Offense vs South Dakota

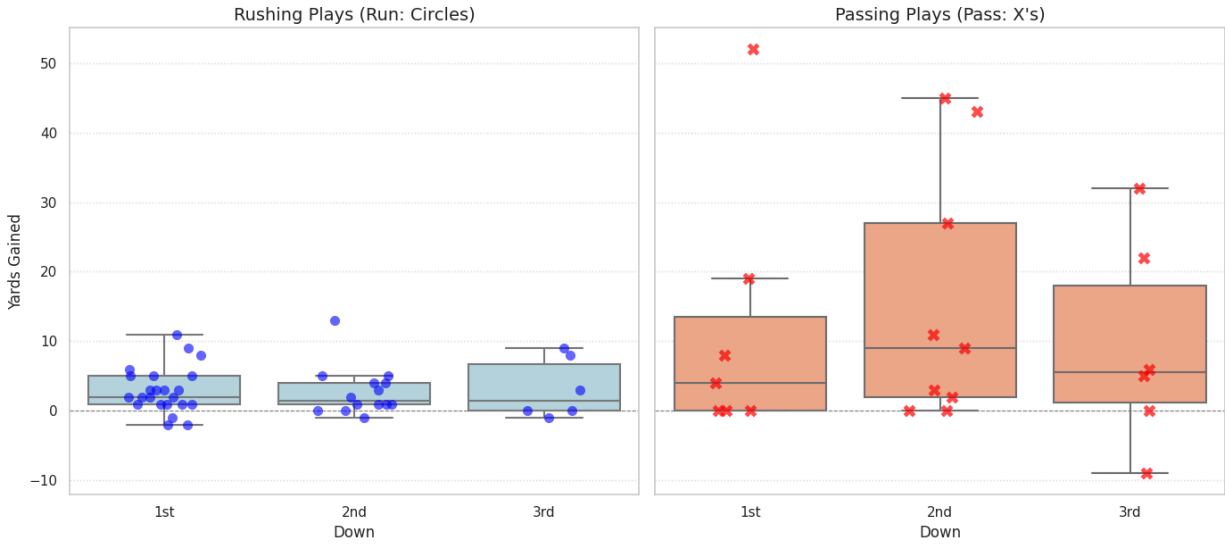




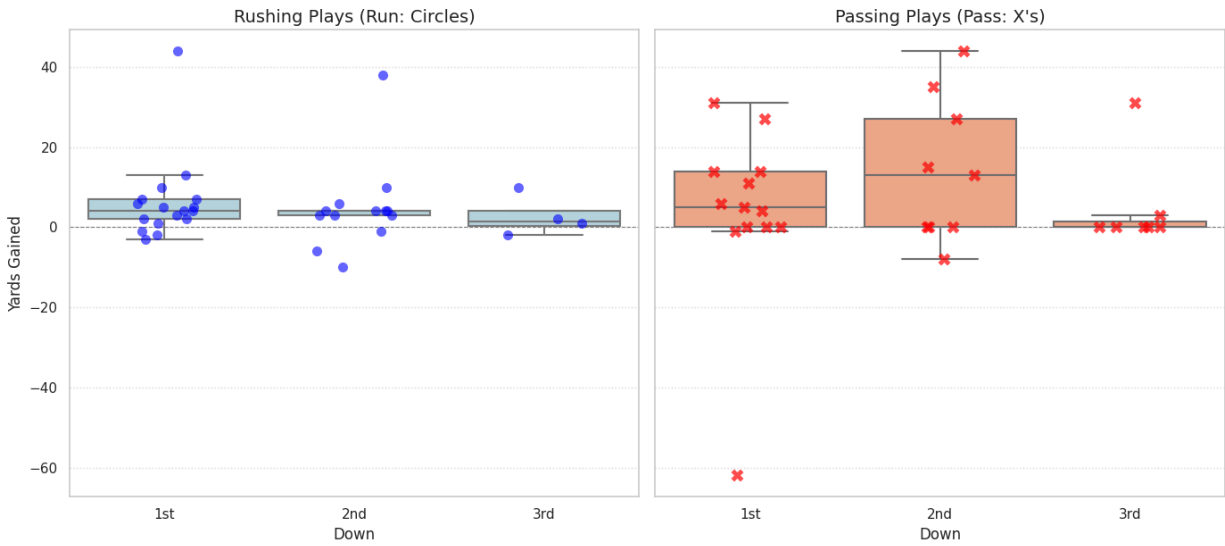
Iowa State Yards Gained vs Arizona State: Run vs Pass by Down (Box & Scatter)



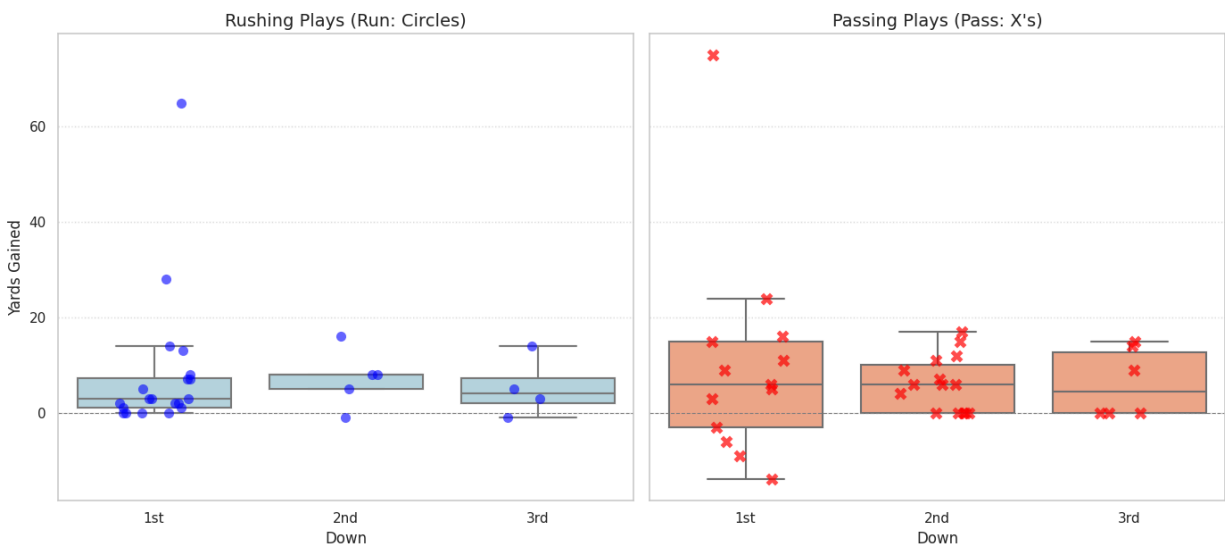
Iowa State Yards Gained vs Arizona: Run vs Pass by Down (Box & Scatter)



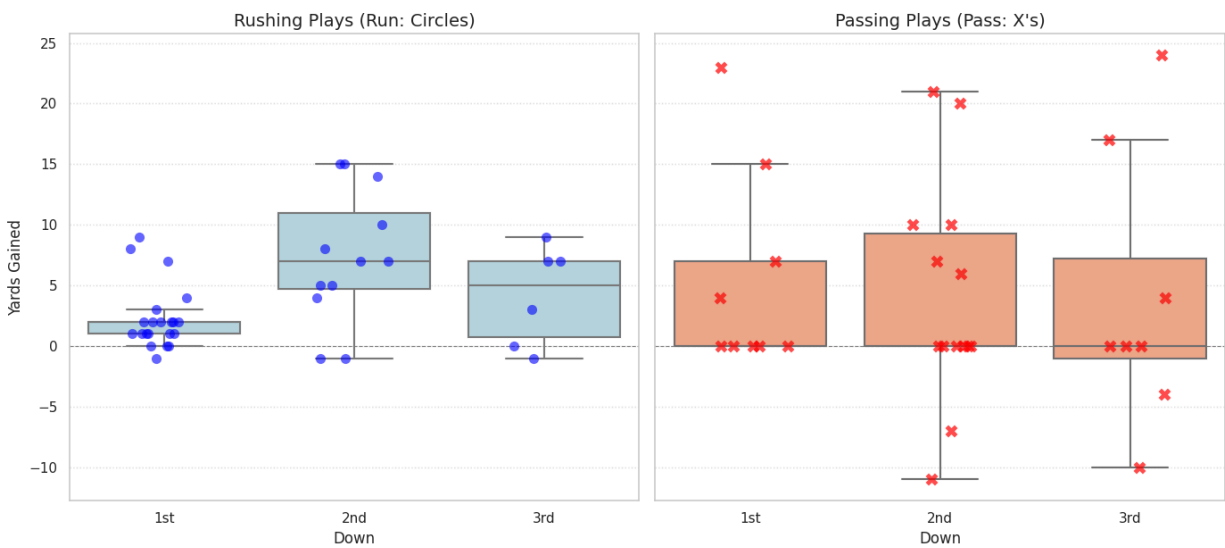
Iowa State Yards Gained vs Arkansas State: Run vs Pass by Down (Box & Scatter)



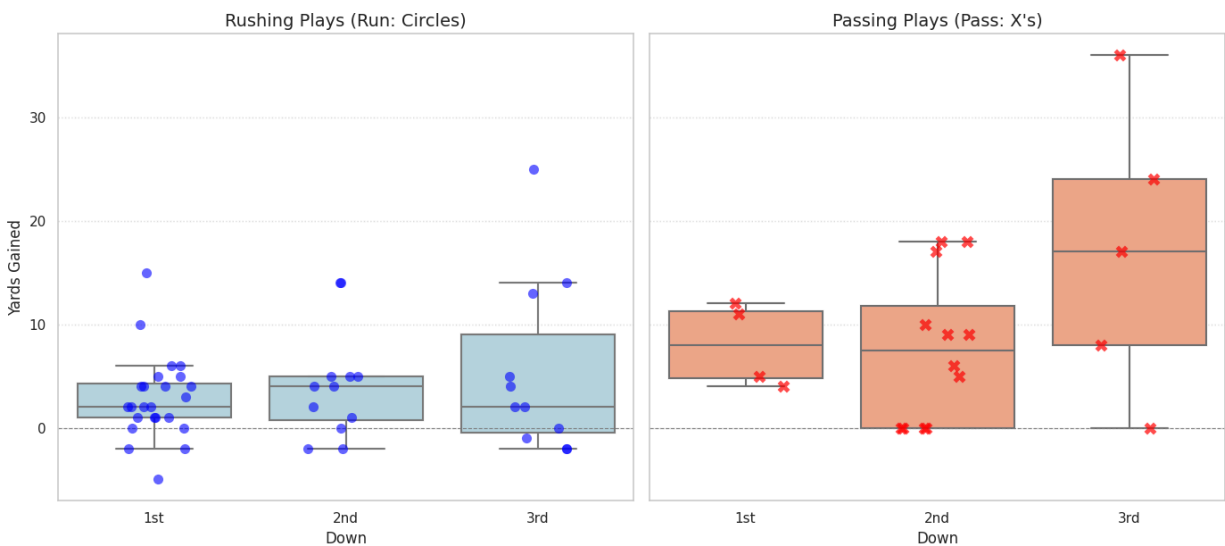
Iowa State Yards Gained vs BYU: Run vs Pass by Down (Box & Scatter)



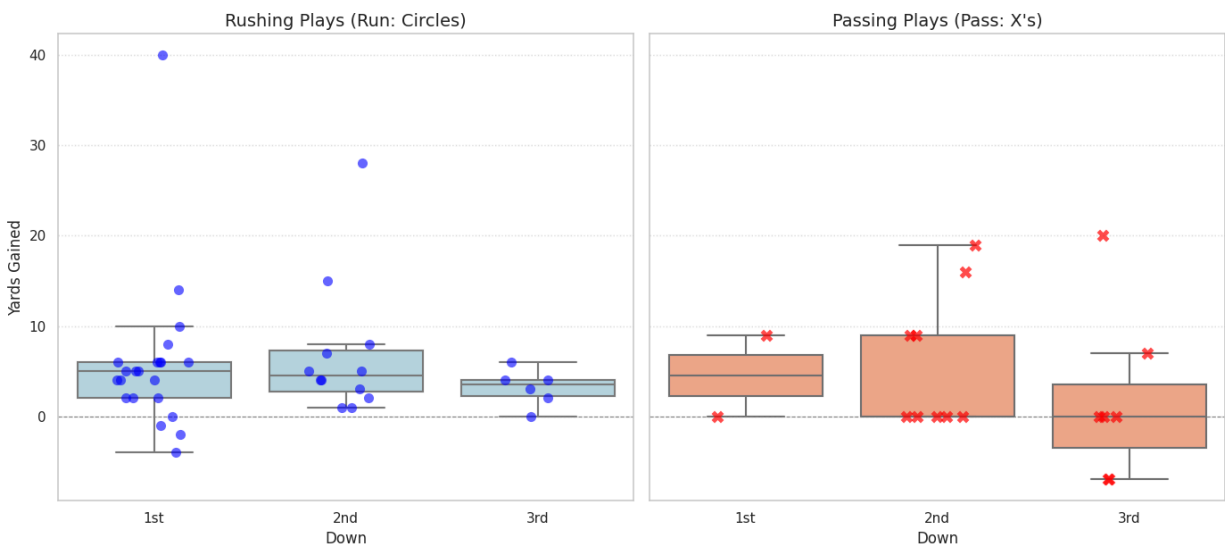
Iowa State Yards Gained vs Kansas State: Run vs Pass by Down (Box & Scatter)



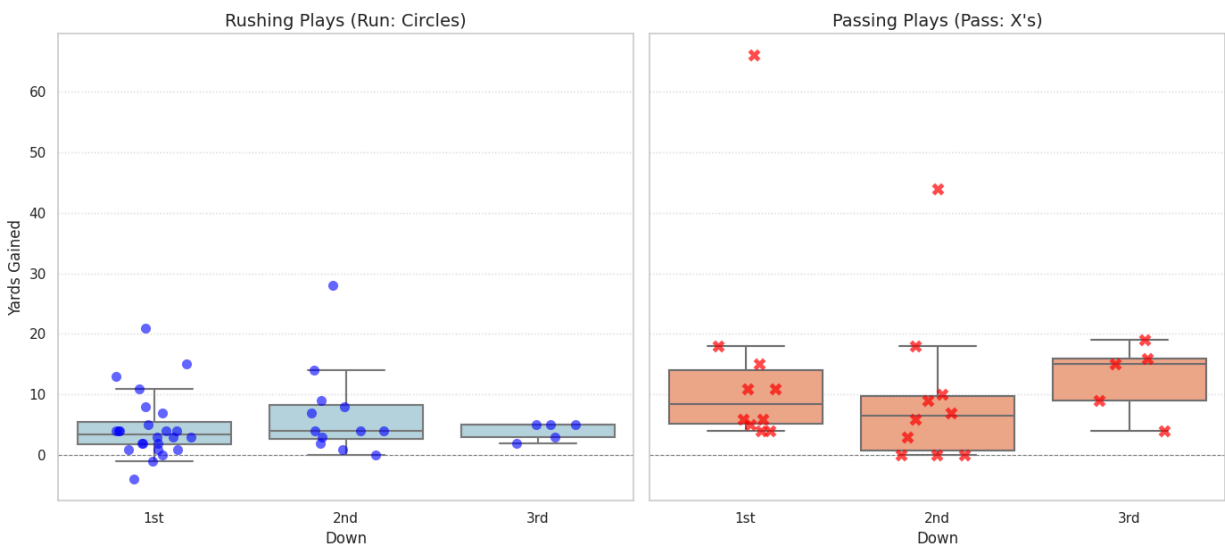
Iowa State Yards Gained vs Kansas: Run vs Pass by Down (Box & Scatter)



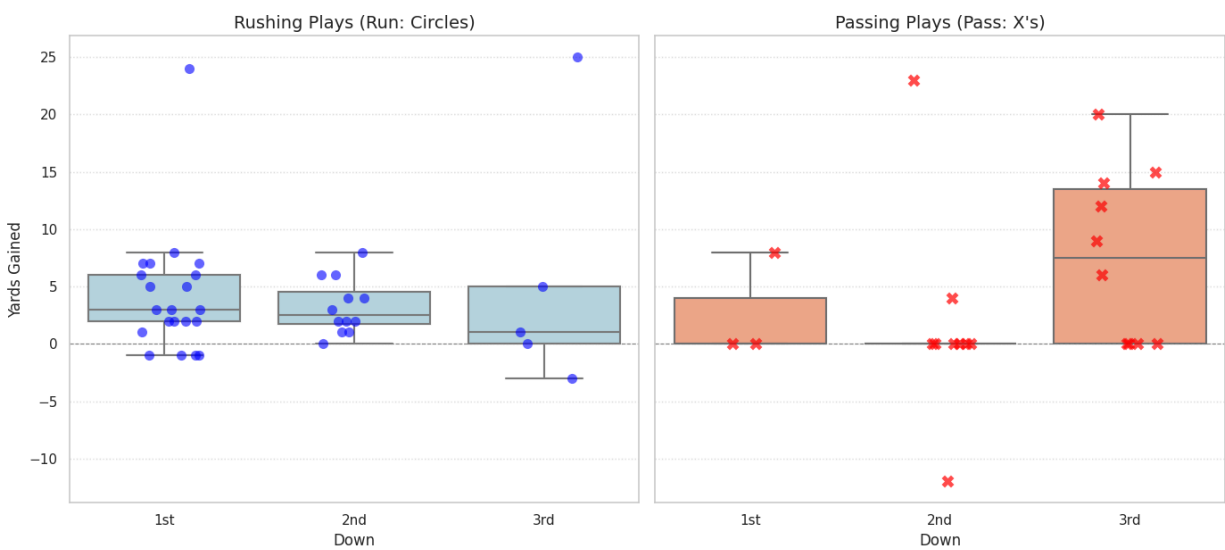
Iowa State Yards Gained vs Oklahoma State: Run vs Pass by Down (Box & Scatter)



### Iowa State Yards Gained vs South Dakota: Run vs Pass by Down (Box & Scatter)



### Iowa State Yards Gained vs TCU: Run vs Pass by Down (Box & Scatter)



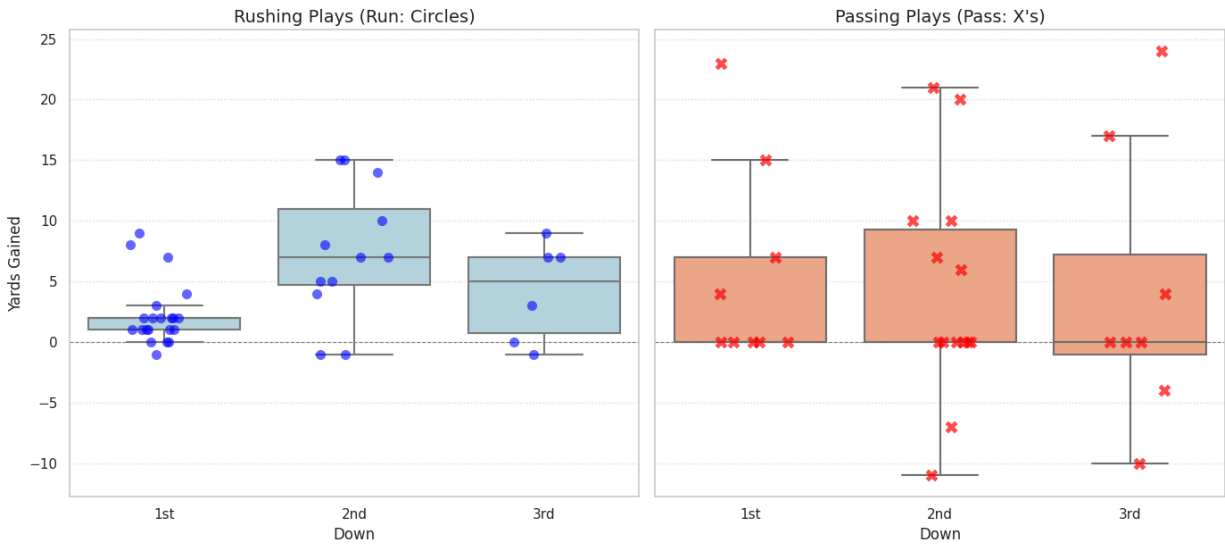
# ScatterBoxPlot



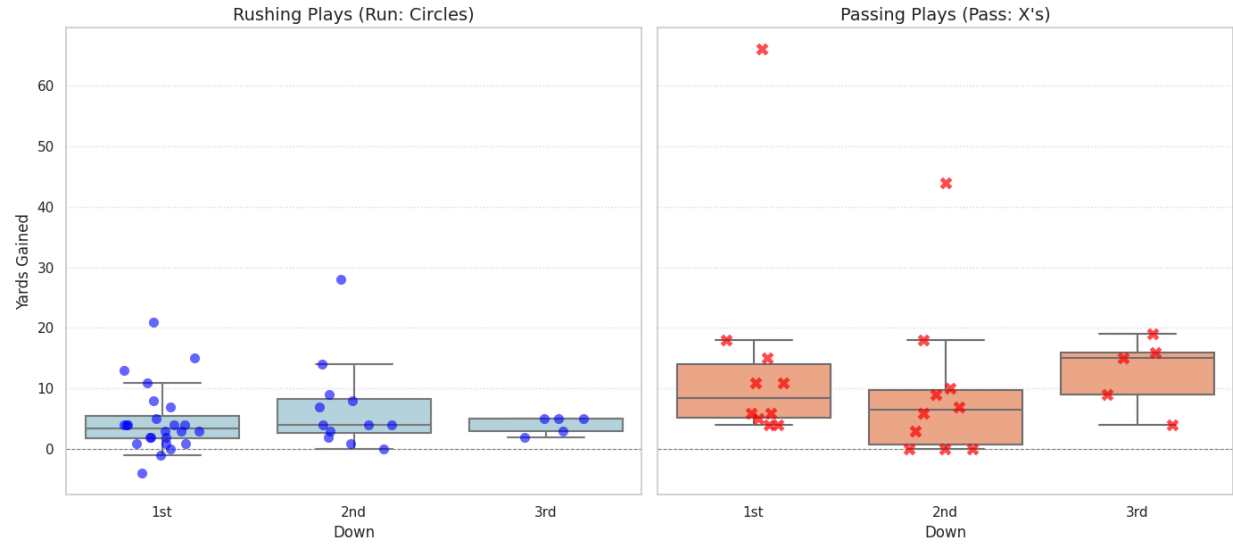
By: Malachi Taylor

The purpose of this box and scatter plot is to display run and pass plays with their distance gained separated by the down. Blue circles indicate rushing plays and red X's signal passing plays. I chose this graph because it gives a lot of information in one picture: The mean, the interquartile range, and the min/max values.

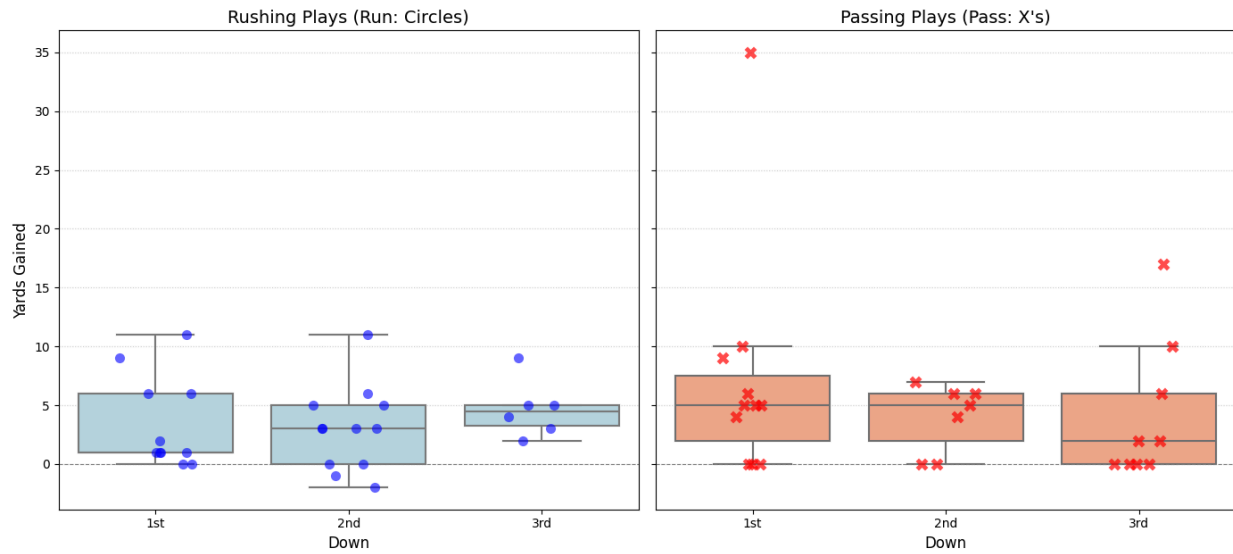
Iowa State Yards Gained vs Kansas State: Run vs Pass by Down (Box & Scatter)



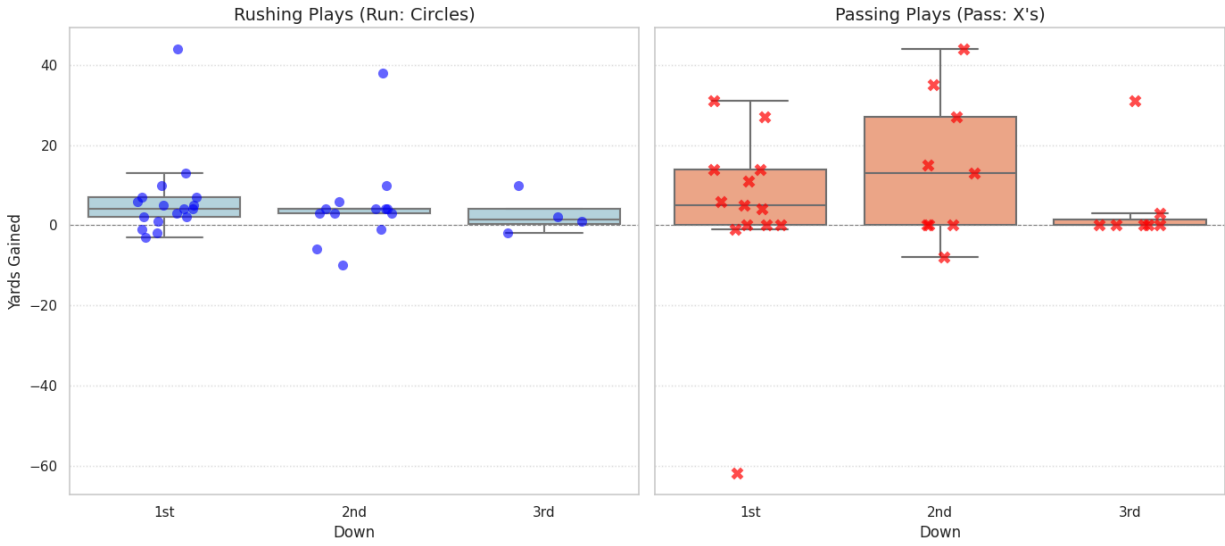
Iowa State Yards Gained vs South Dakota: Run vs Pass by Down (Box & Scatter)



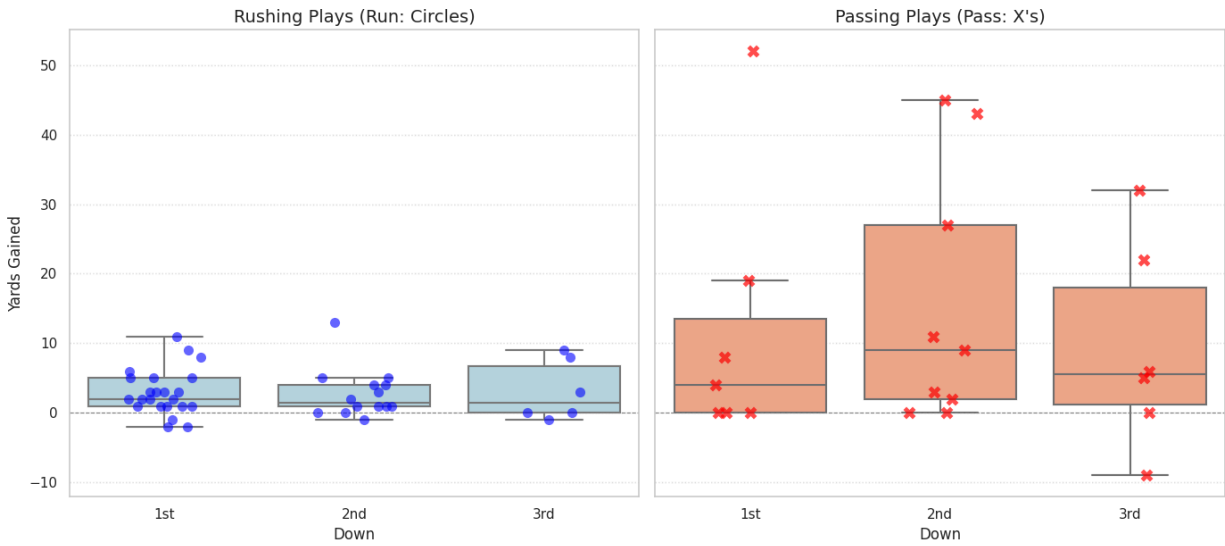
Iowa State Yards Gained vs Iowa: Run vs Pass by Down (Box & Scatter)



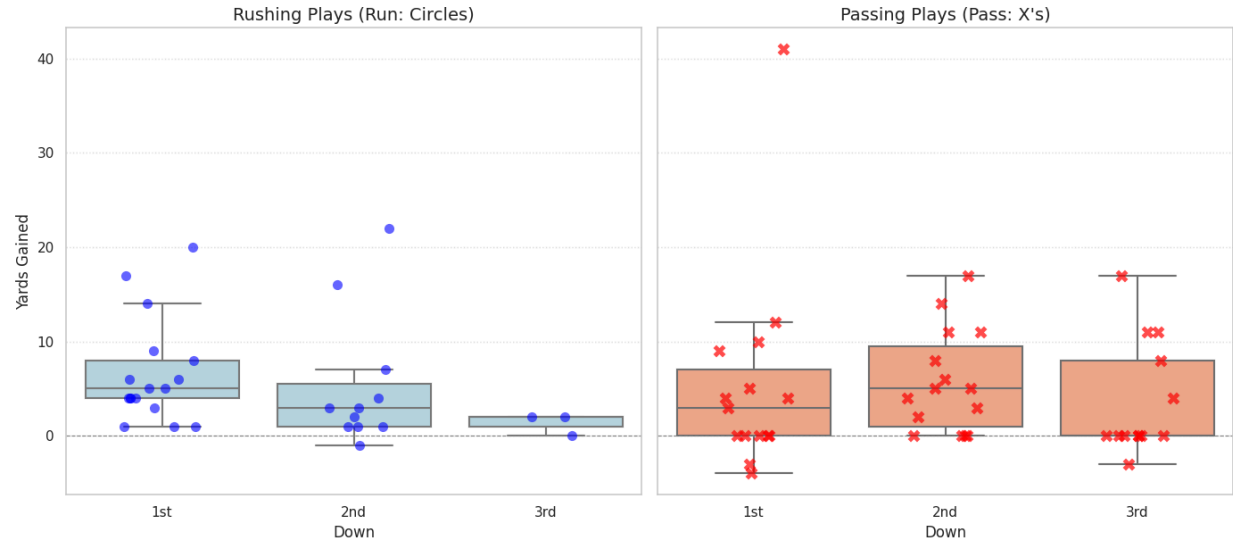
Iowa State Yards Gained vs Arkansas State: Run vs Pass by Down (Box & Scatter)



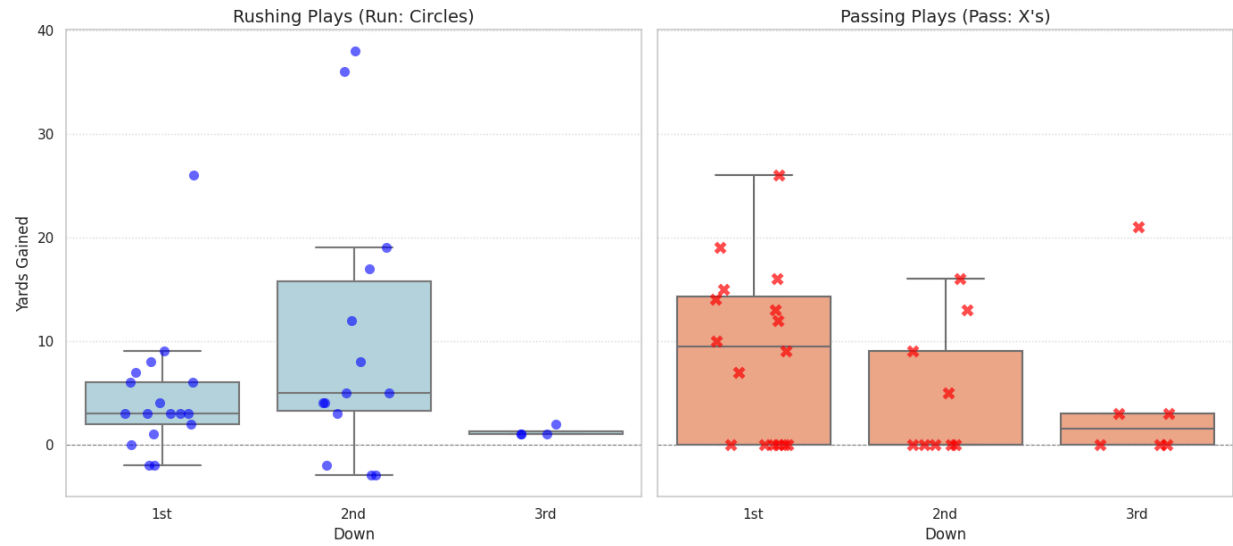
Iowa State Yards Gained vs Arizona: Run vs Pass by Down (Box & Scatter)



Iowa State Yards Gained vs Cincinnati: Run vs Pass by Down (Box & Scatter)



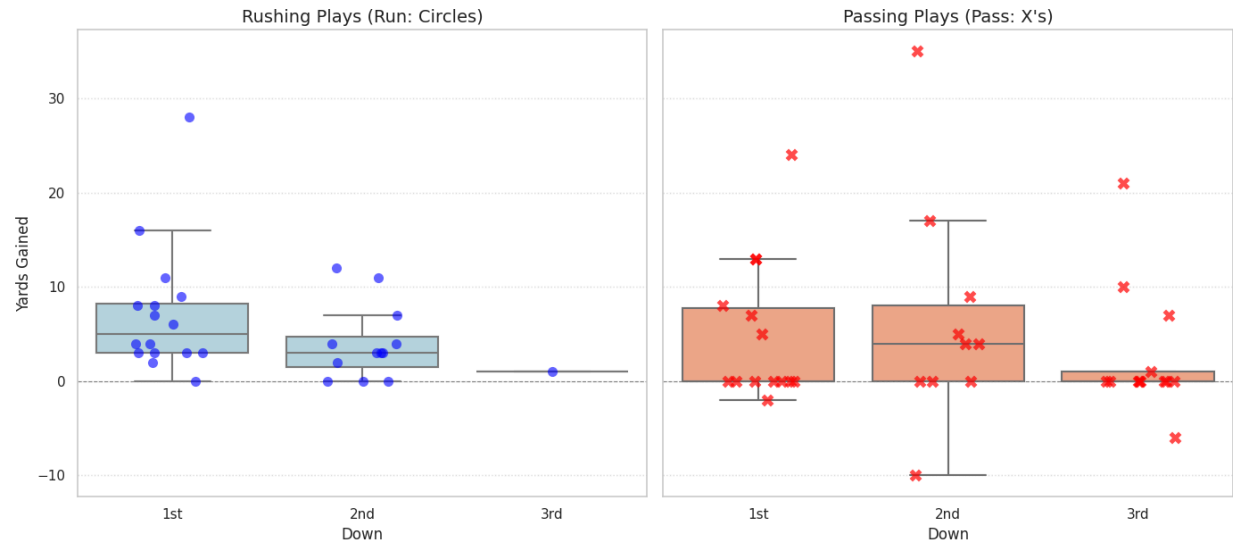
Iowa State Yards Gained vs Colorado: Run vs Pass by Down (Box & Scatter)



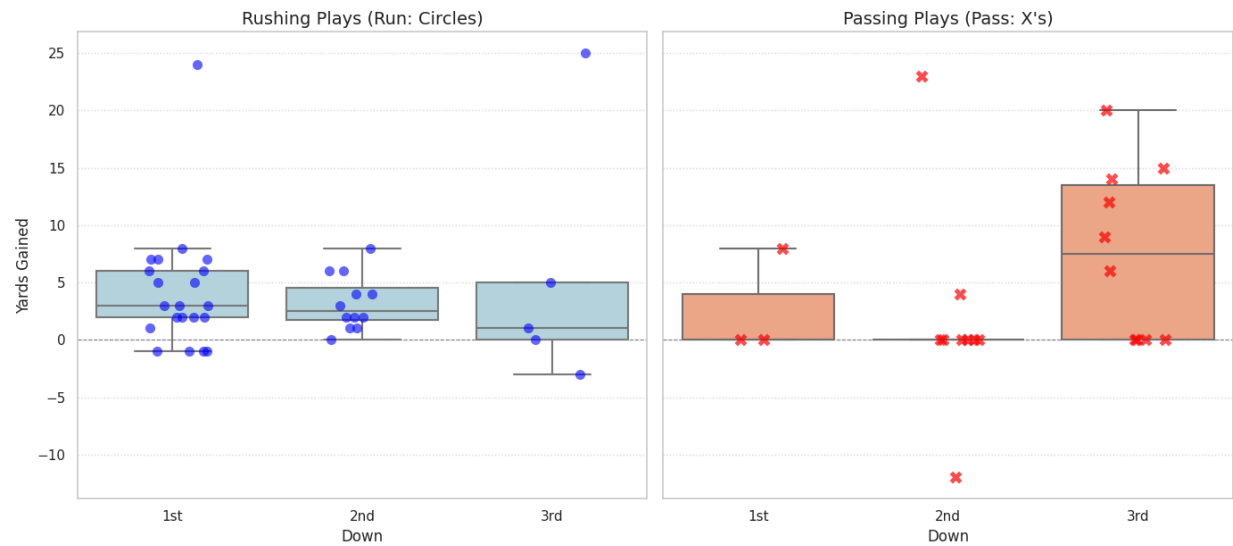
**Rushing Plays (Run: Circles)**

**Passing Plays (Pass: X's)**

Iowa State Yards Gained vs Arizona State: Run vs Pass by Down (Box & Scatter)



Iowa State Yards Gained vs TCU: Run vs Pass by Down (Box & Scatter)



The figure consists of two side-by-side box plots. The left plot, titled 'Rushing Plays (Run: Circles)', shows yards gained for rushing plays. The right plot, titled 'Passing Plays (Pass: X's)', shows yards gained for passing plays. Both plots have 'Yards Gained' on the y-axis (0 to 30) and 'Down' on the x-axis (1st, 2nd, 3rd). The box plots are light blue for rushing and light orange for passing. Individual data points are overlaid on the box plots: blue circles for rushing and red 'X's for passing. In the rushing plot, the median yards gained increases slightly from 1st to 3rd down, with a notable outlier at 3rd down. In the passing plot, the median yards gained increases significantly from 1st to 3rd down, with a large spread of data points and a high outlier at 3rd down.

Down	Play Type	Yards Gained (Approximate)
1st	Rushing	-2, 0, 1, 2, 3, 4, 5, 6, 7, 10, 15
2nd	Rushing	-2, 0, 2, 3, 4, 5, 6, 7, 14
3rd	Rushing	-2, 0, 2, 3, 4, 5, 6, 7, 13, 25
1st	Passing	4, 5, 6, 7, 8, 9, 10, 11, 12
2nd	Passing	0, 0, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18
3rd	Passing	0, 8, 17, 24, 35

The figure consists of two side-by-side box plots. The left plot, titled 'Rushing Plays (Run: Circles)', displays the distribution of yards gained on rushing plays. The right plot, titled 'Passing Plays (Pass: X's)', displays the distribution of yards gained on passing plays. Both plots share a common y-axis labeled 'Yards Gained' ranging from 0 to 40, and a common x-axis labeled 'Down' with categories '1st', '2nd', and '3rd'.

**Rushing Plays (Run: Circles)**

Down	Yards Gained (Circles)
1st	-4, -2, 0, 1, 2, 3, 4, 5, 5, 6, 6, 7, 8, 10, 14
2nd	1, 1, 2, 4, 5, 6, 7, 8, 15, 28
3rd	0, 1, 2, 3, 4, 5, 6

**Passing Plays (Pass: X's)**

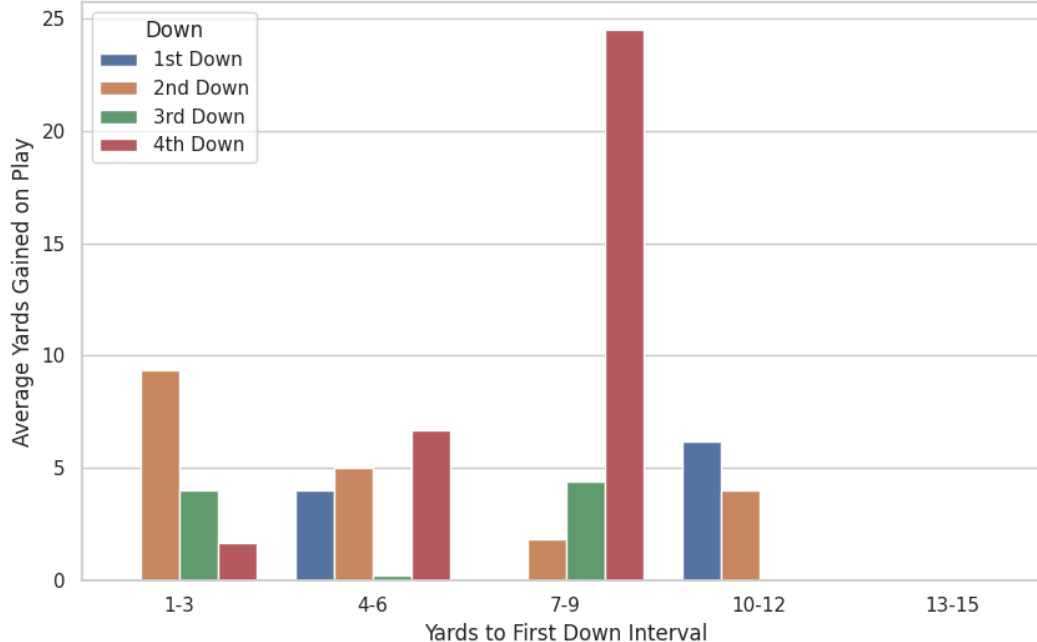
Down	Yards Gained (X's)
1st	0, 0, 9
2nd	0, 0, 0, 0, 0, 0, 9, 9, 16, 19
3rd	-5, 0, 0, 0, 0, 7

# Bar Chart

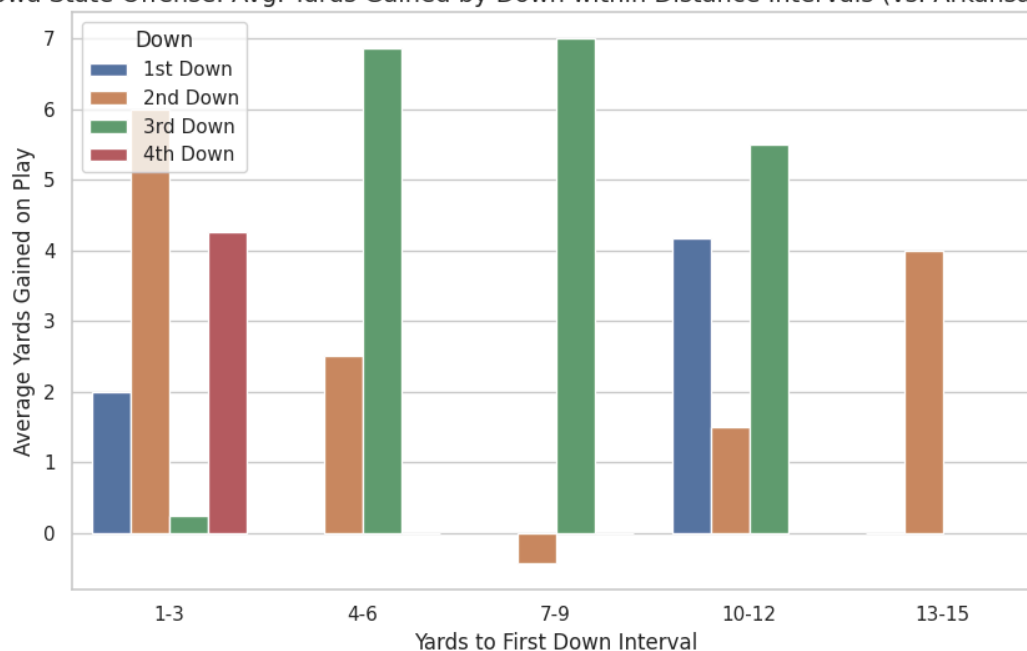


The goal of our project was to analyze and understand what plays work best for the Iowa State football team based on down and distance. My part of the project did not focus on plays and formations, but solely on down-and-distance. The graph I created measured the average yards gained per play at intervals of 3 yards to go, based on down. The down is labeled by color and shown in the legend, and the distance is shown in the x-axis labels. This graph is able to give a simple and easy-to-understand visual of which down and distance was most effective in yards gained, based on the game.

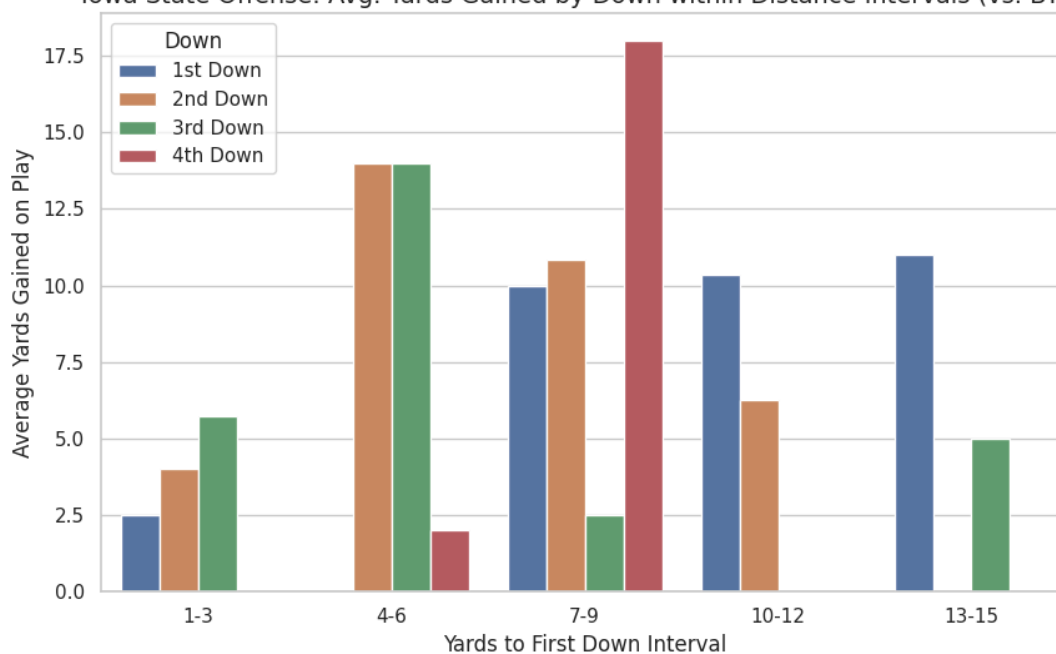
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Arizona State)



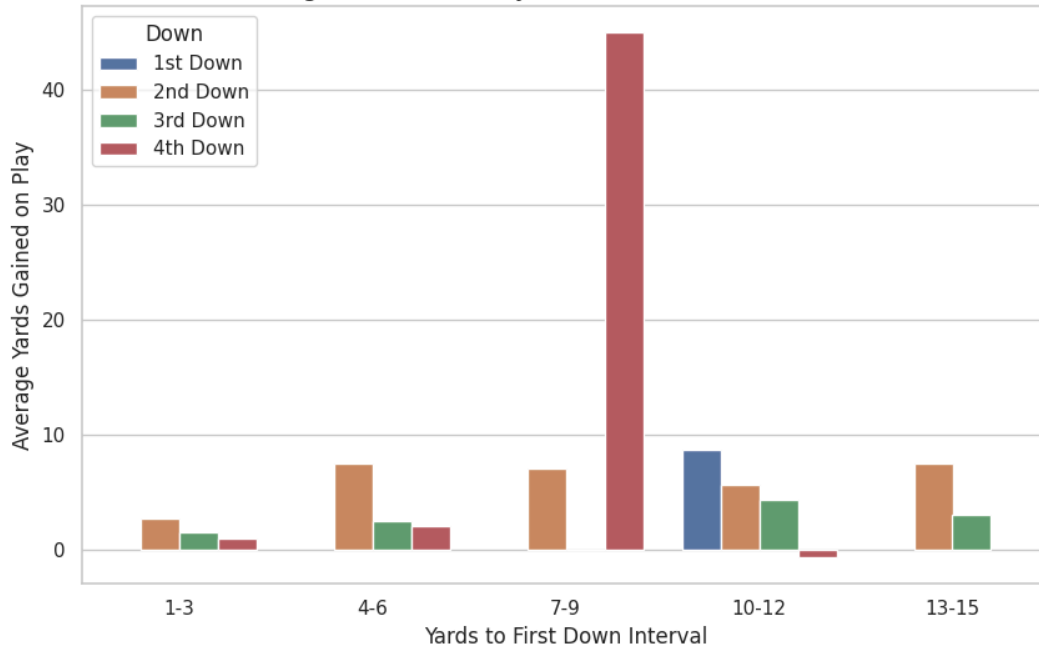
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Arkansas State)



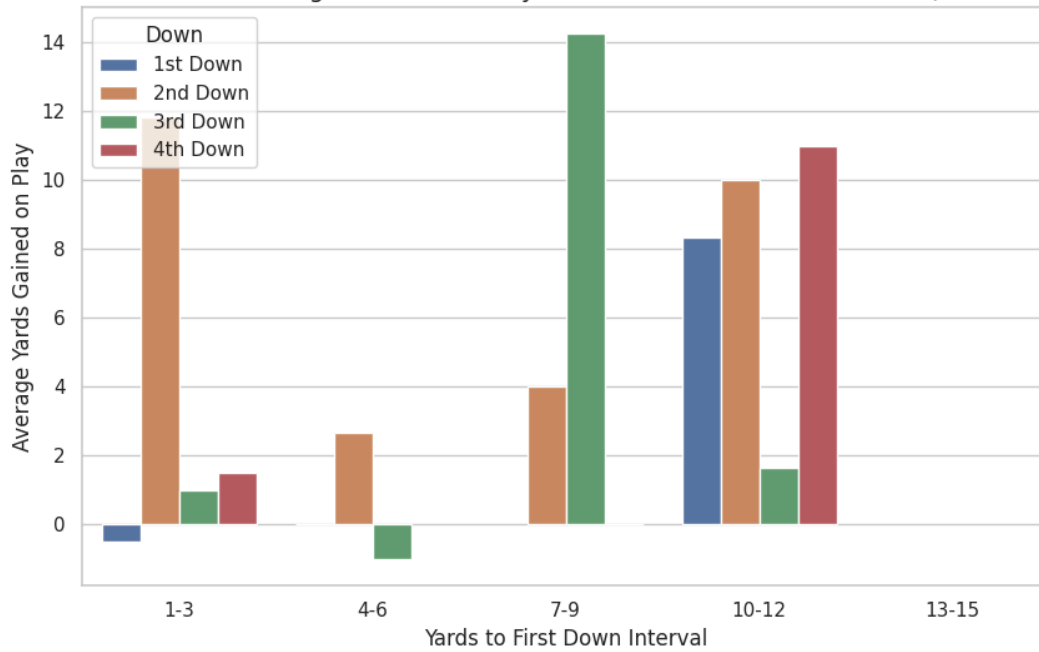
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. BYU)



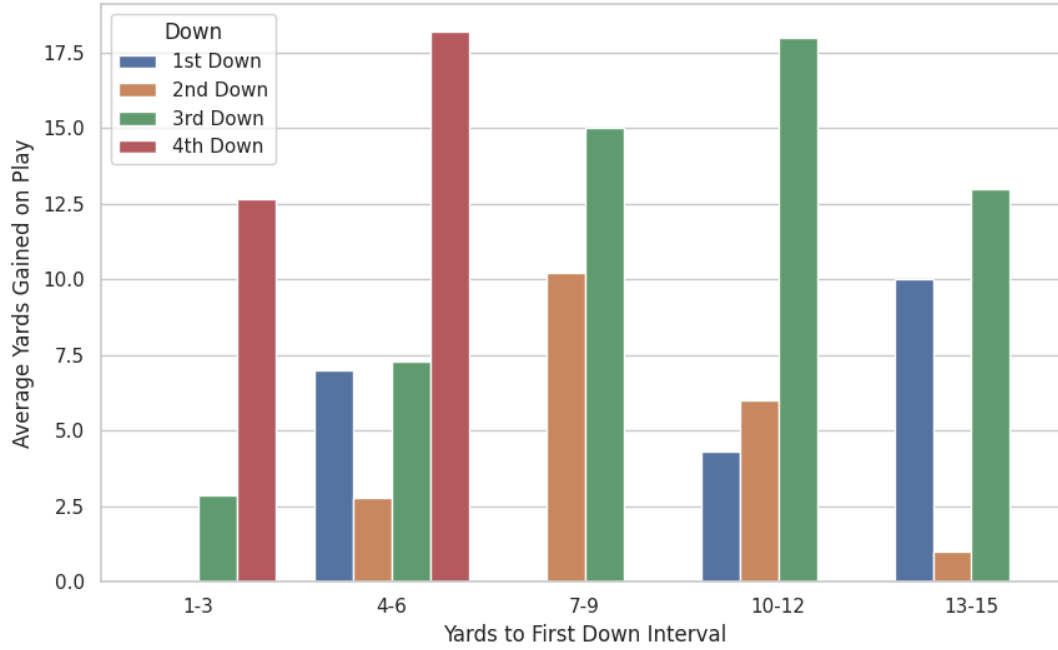
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Cincinnati)



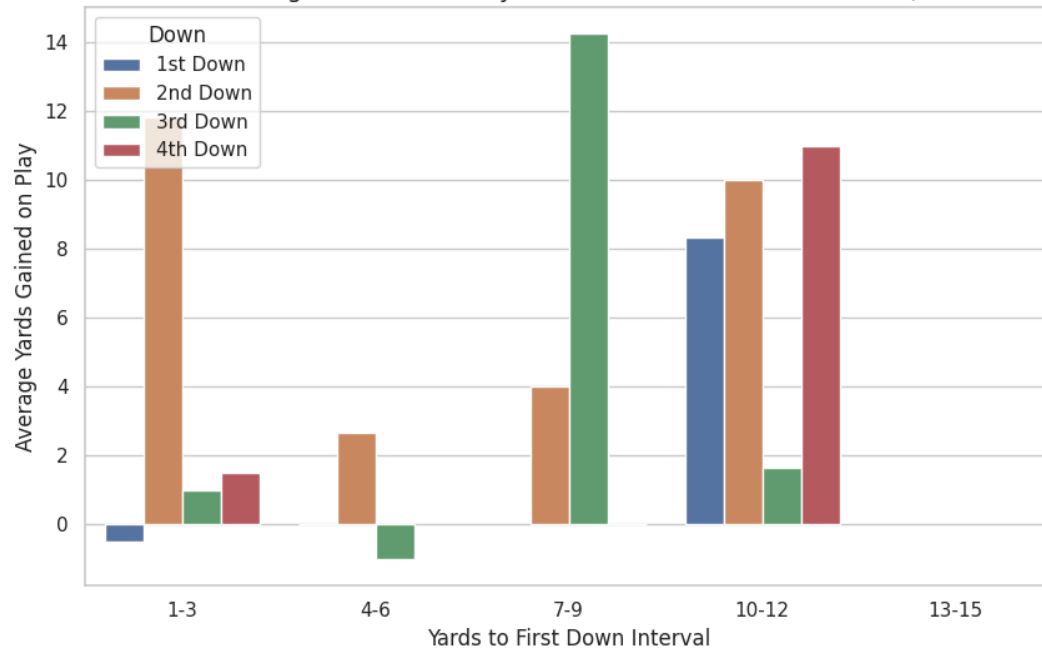
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Colorado)



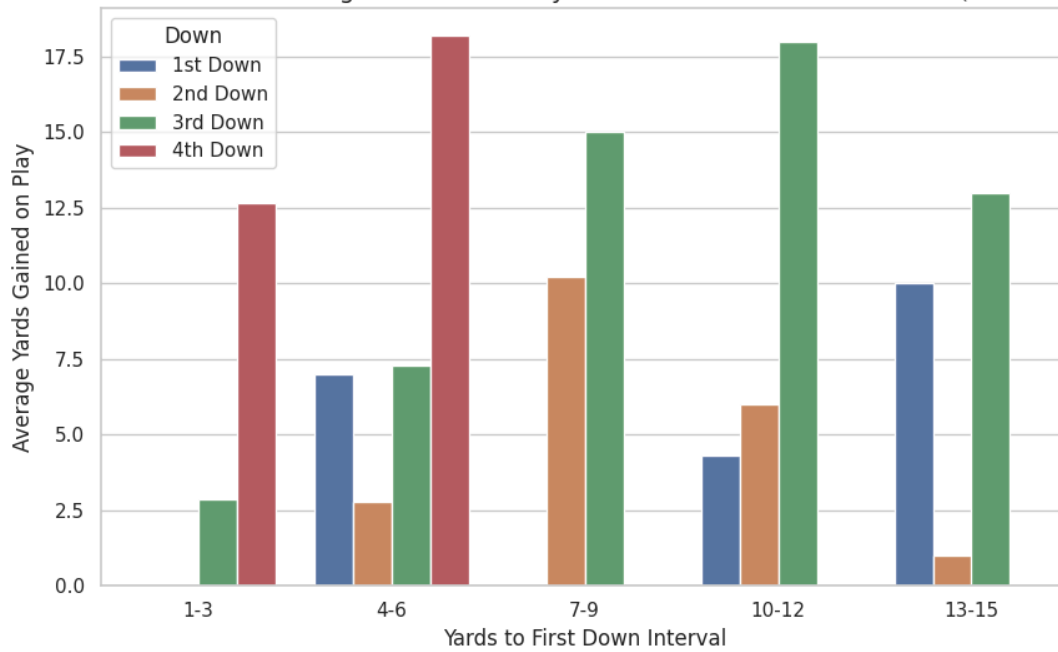
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Iowa)



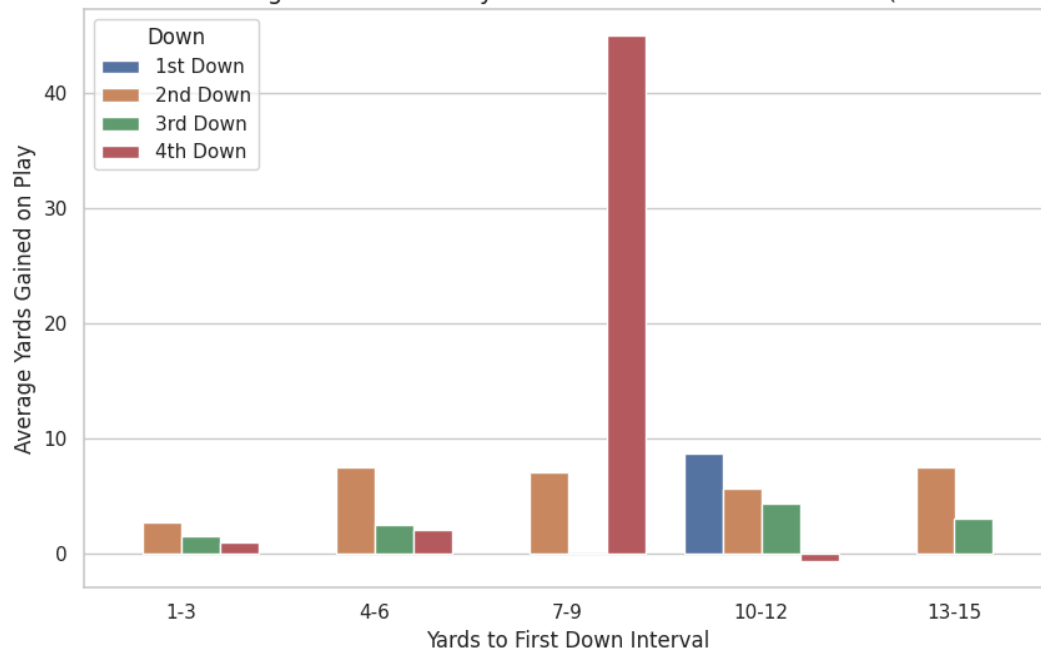
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Kansas State)



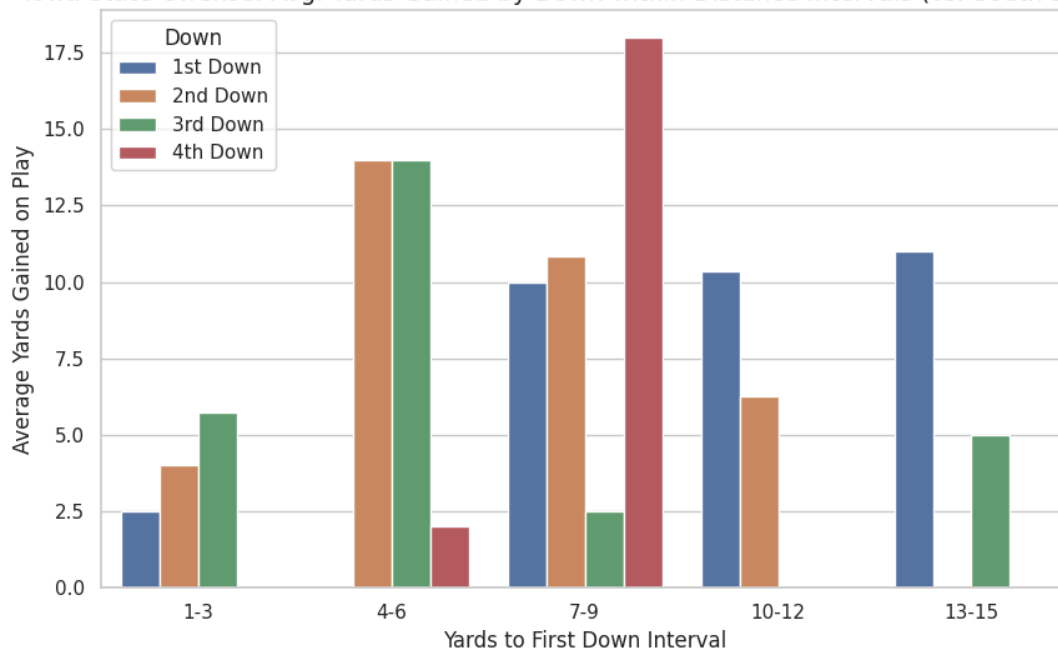
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Kansas)



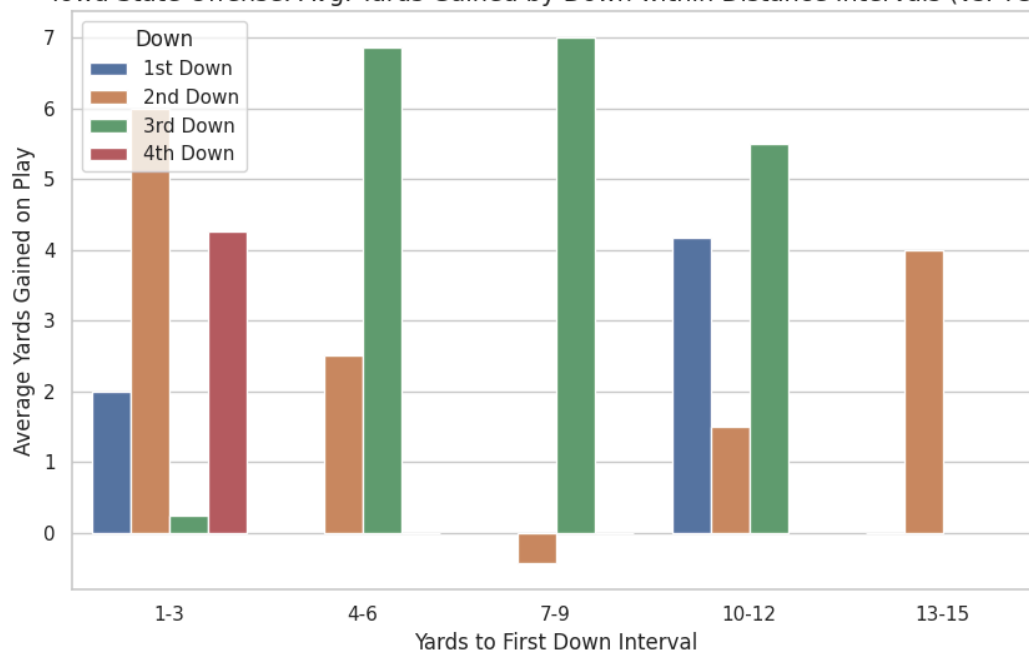
Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. Oklahoma State)



Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. South Dakota)



Iowa State Offense: Avg. Yards Gained by Down within Distance Intervals (vs. TCU)



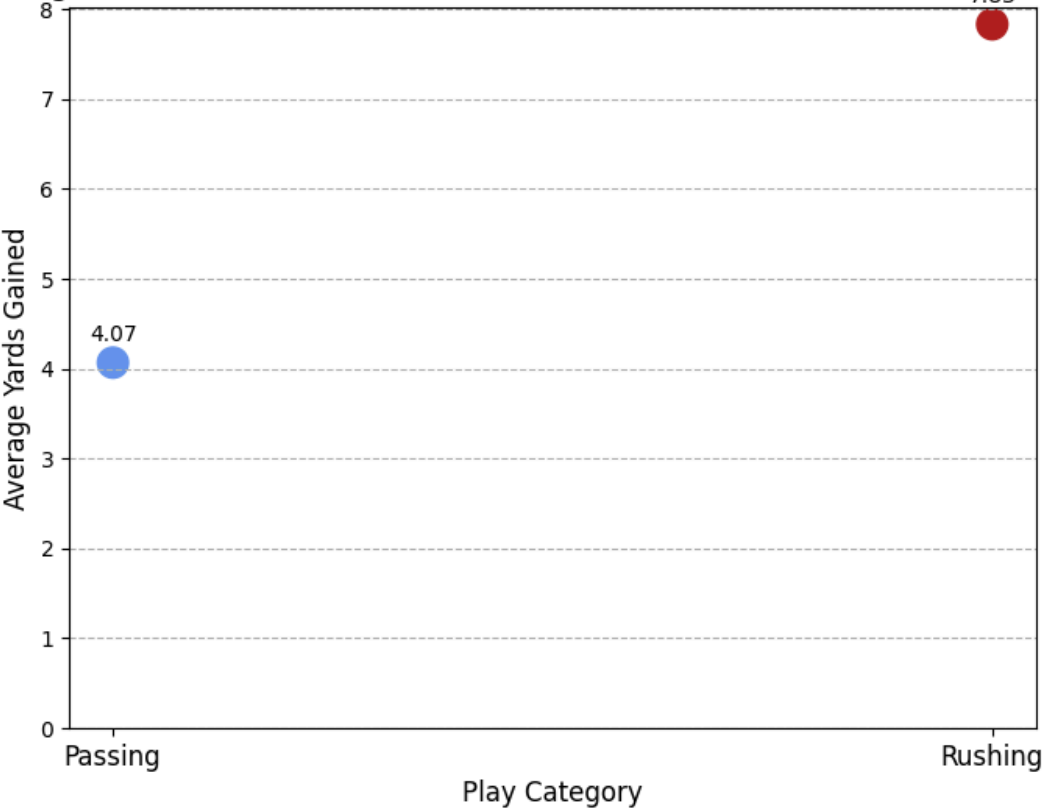
# Average Yards Gained in the Redzone

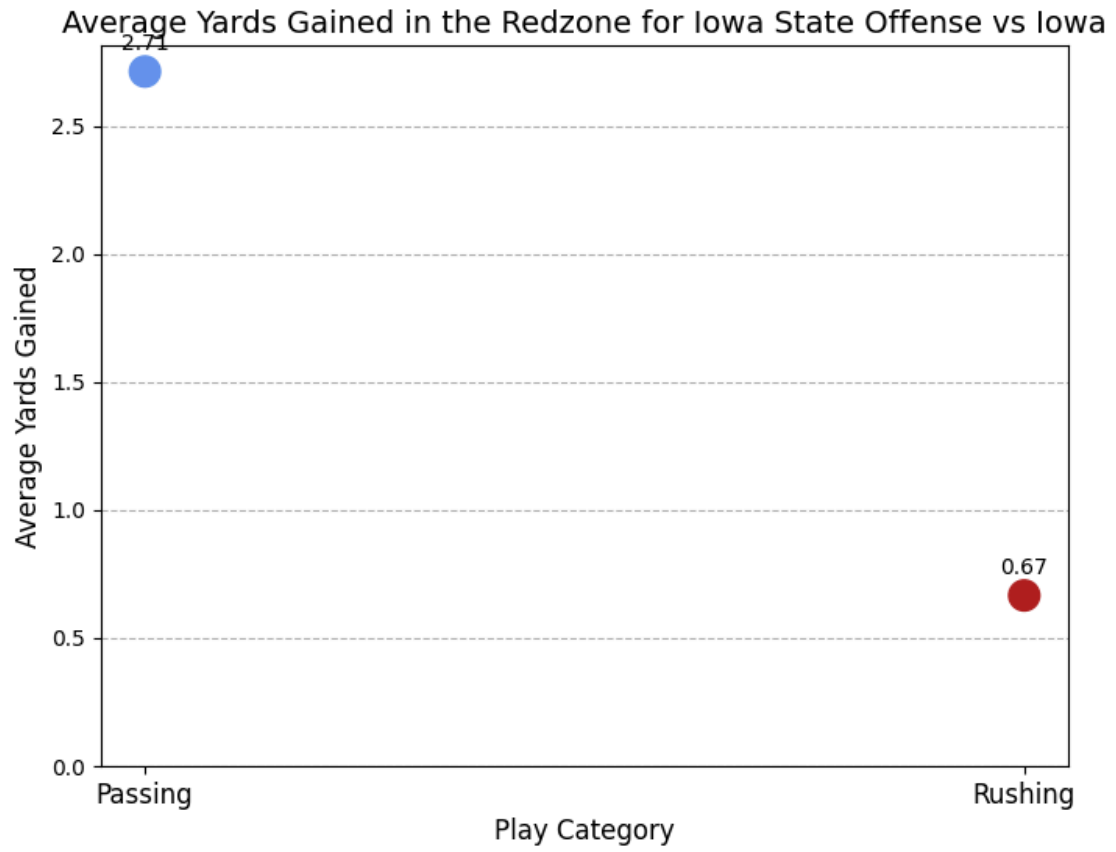
This study examines the Iowa State football team's success with run or pass plays inside the red zone. Drawing from Iowa State's stats from all their games in the 2025 season, I put together these graphs showing the averages for each play type Iowa State ran in the red zone. The Red dot represents the average yards gained by a run in the red zone, while the blue dot represents the average yards gained by a pass in the red zone. This study was made to help determine Iowa State's recipe for success in the red zone against different opponents.

Jacob Gunderson

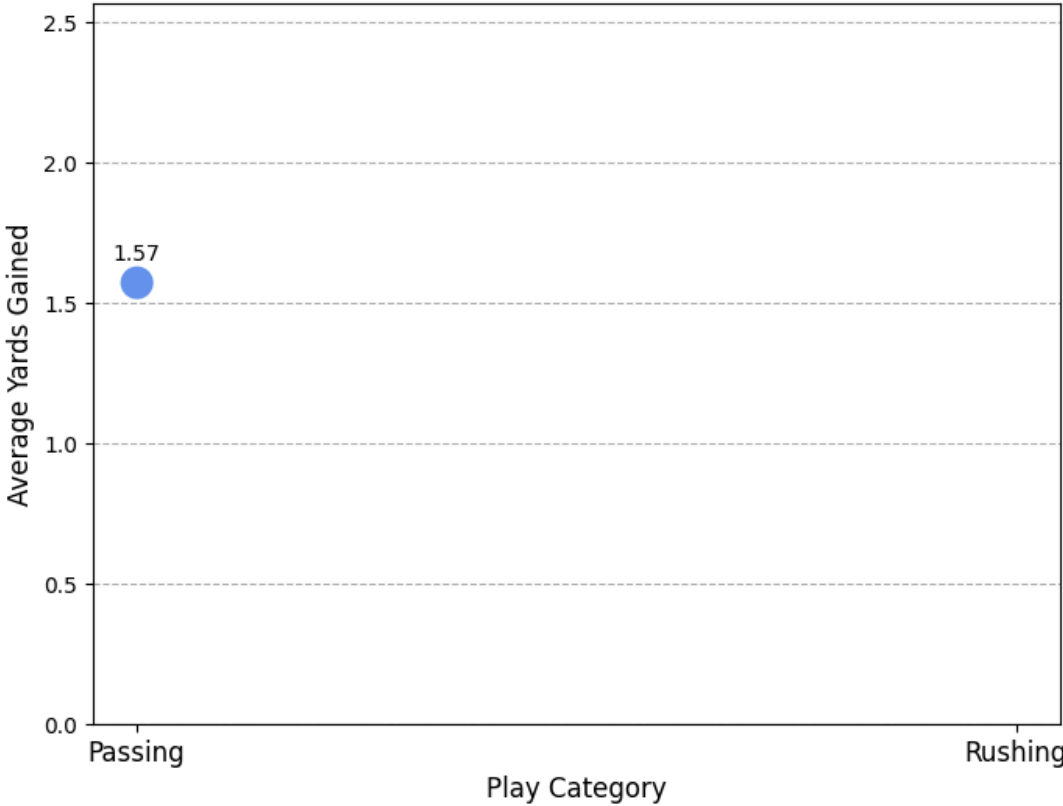


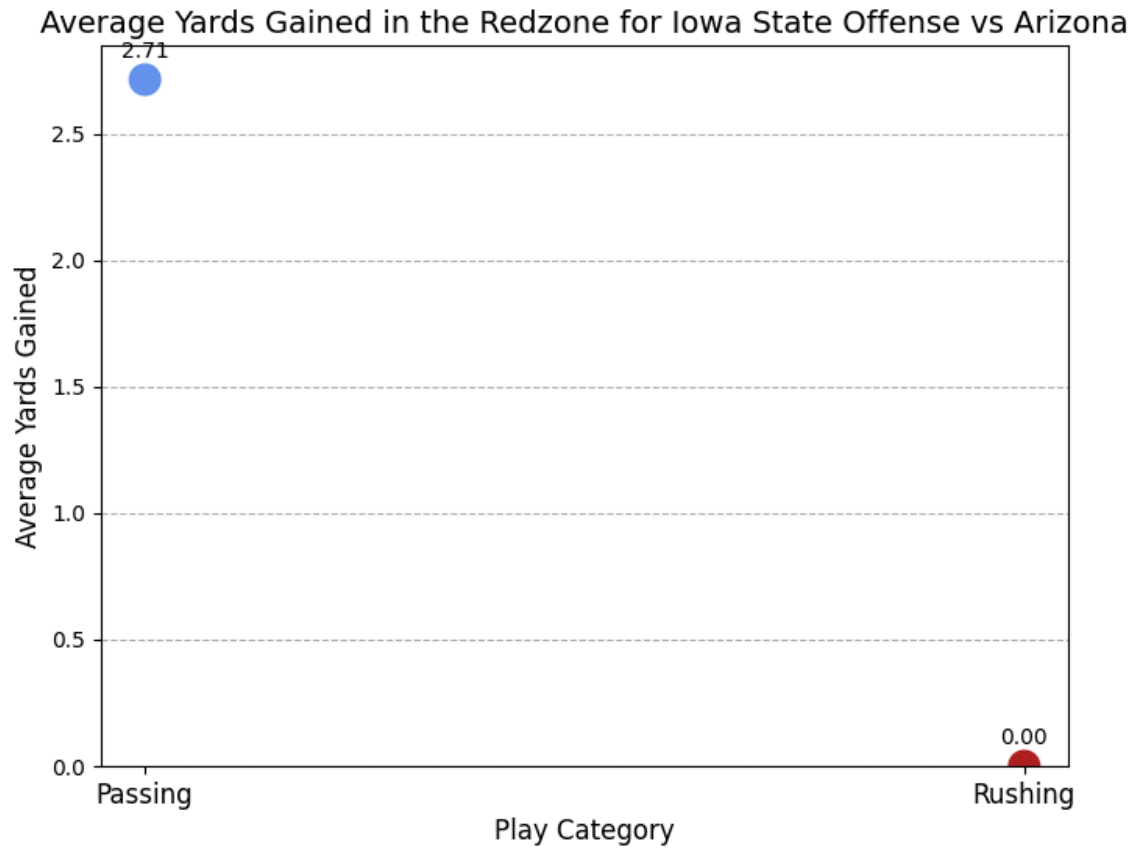
Average Yards Gained in the Redzone for Iowa State Offense vs South Dakota



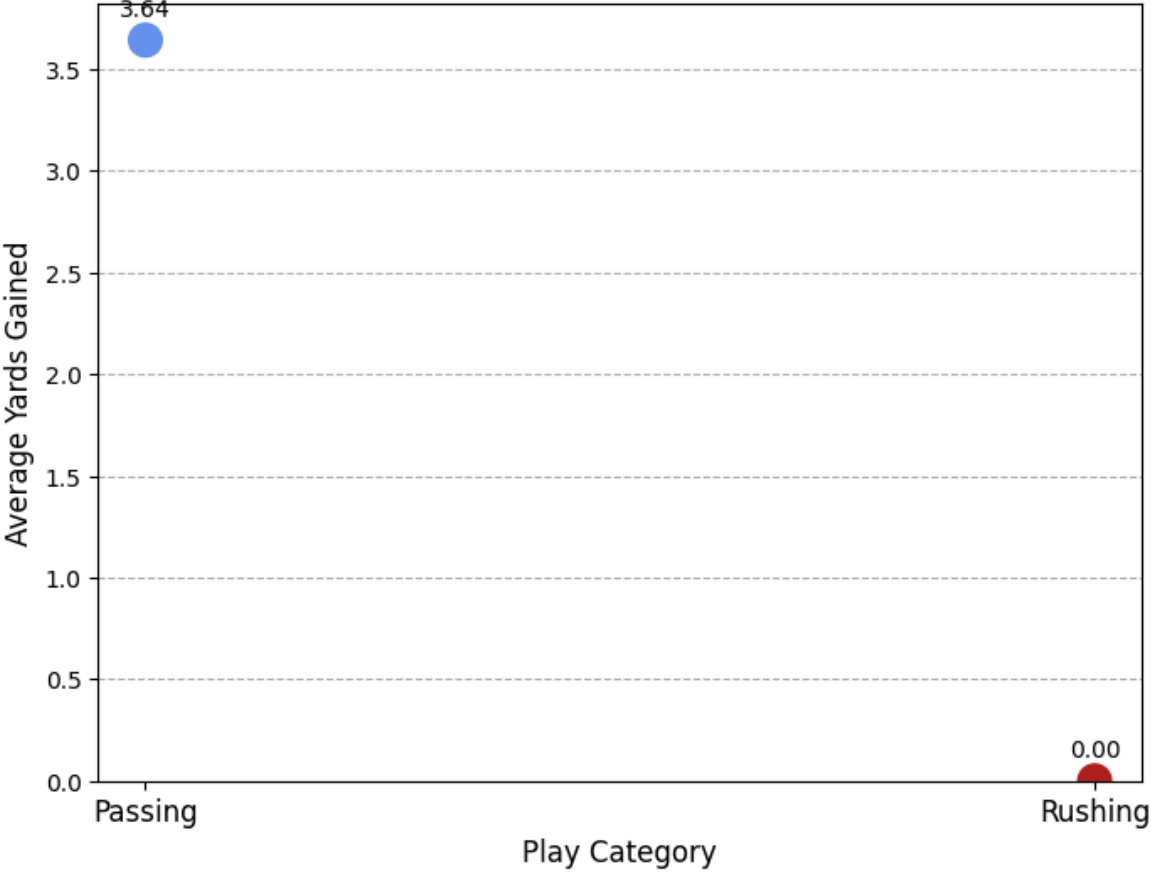


Average Yards Gained in the Redzone for Iowa State Offense vs Arkansas State

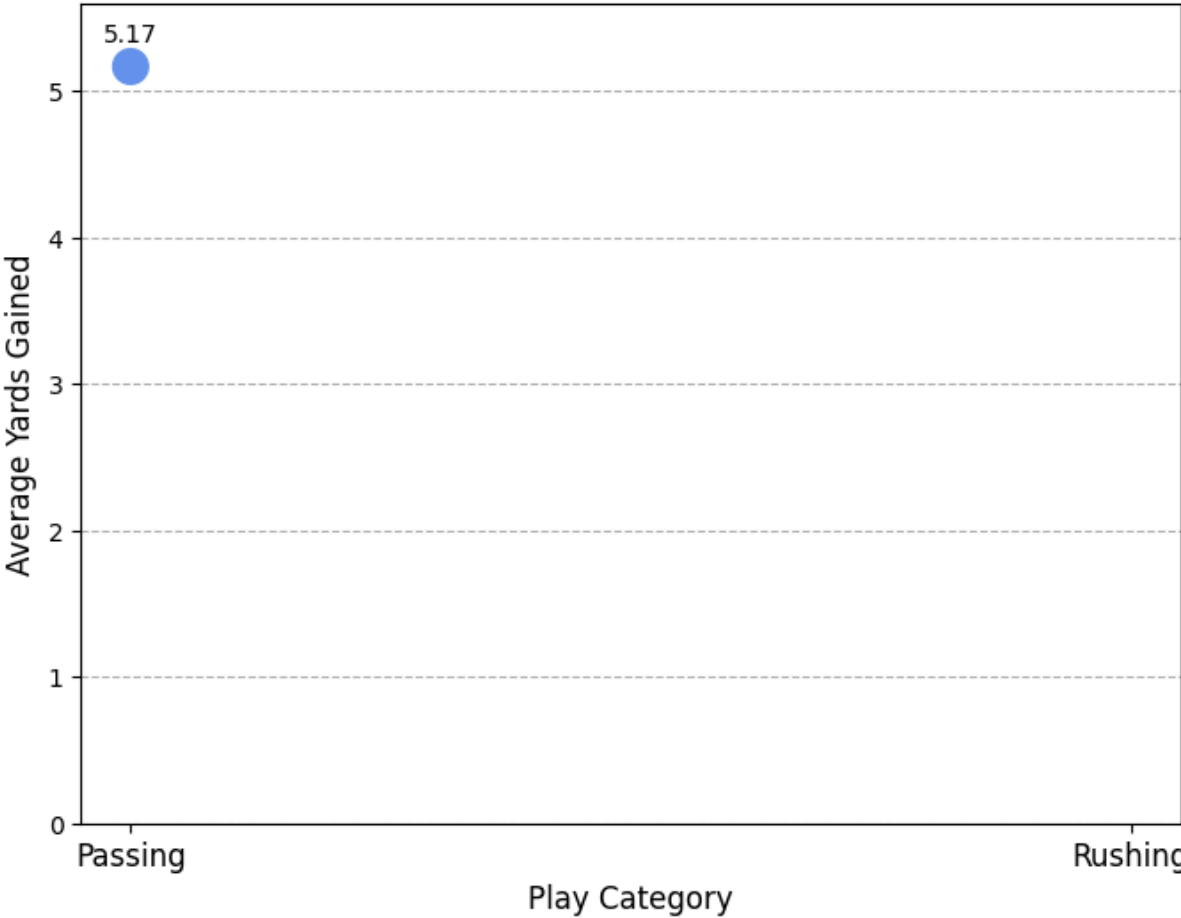




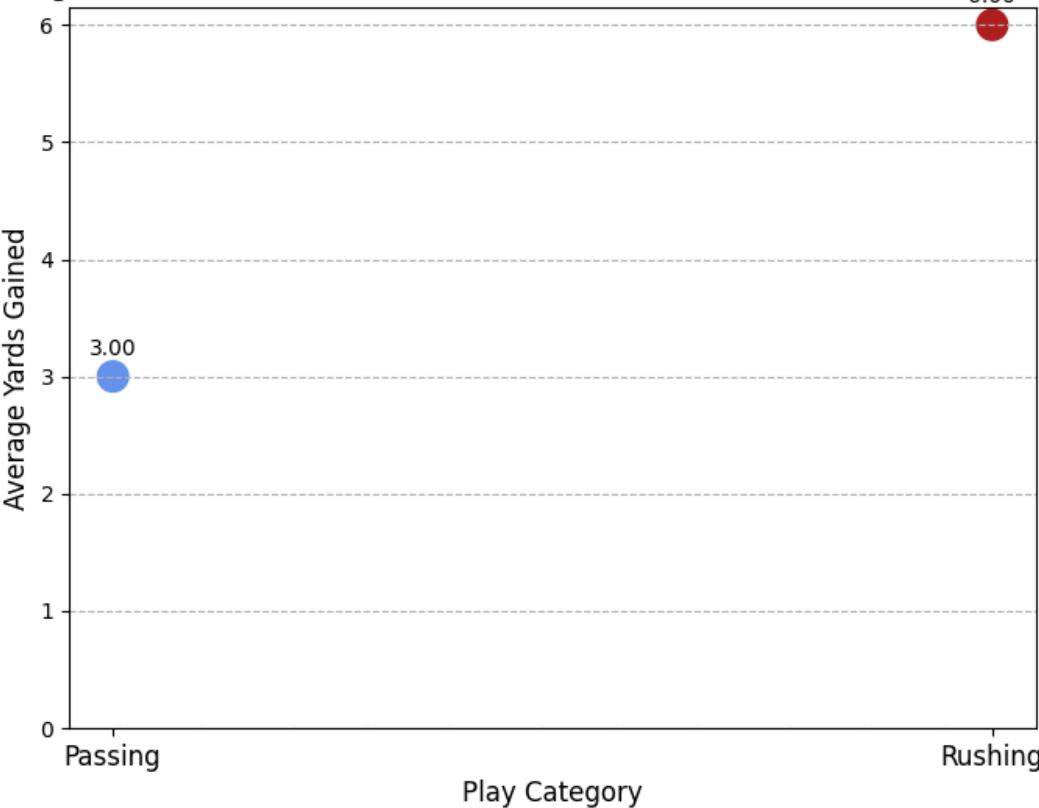
Average Yards Gained in the Redzone for Iowa State Offense vs Colorado

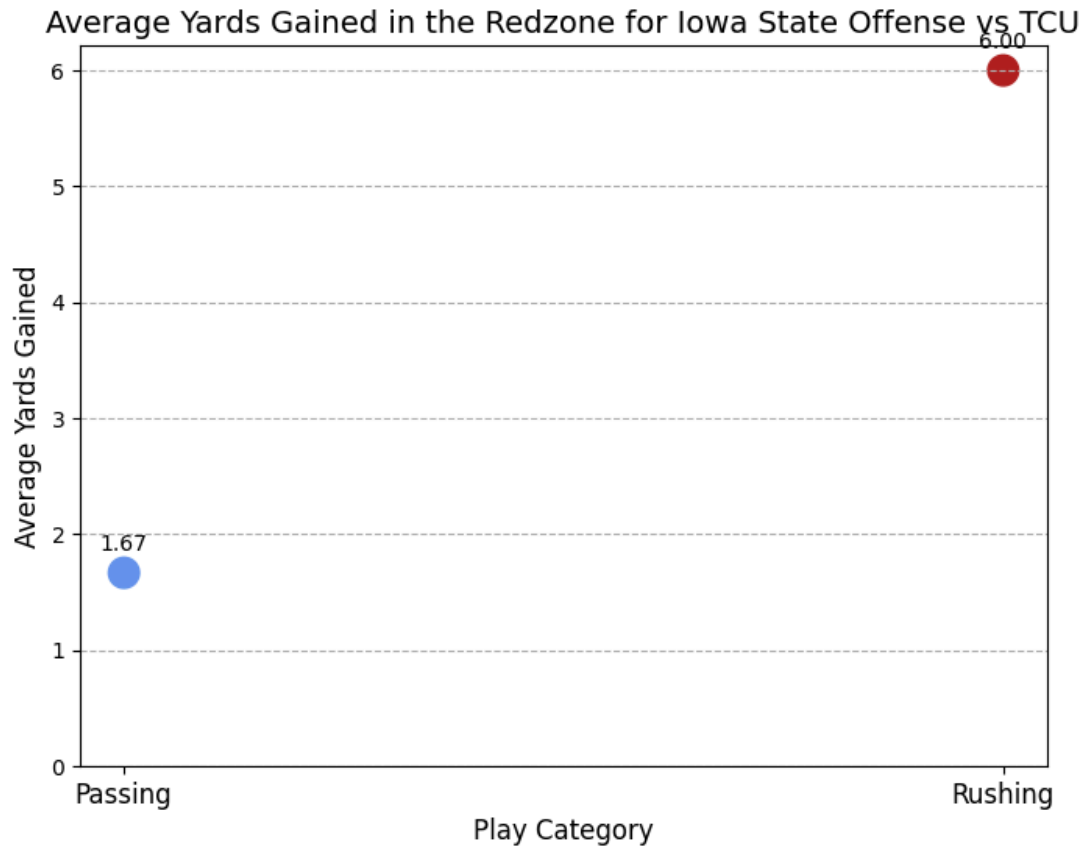


Average Yards Gained in the Redzone for Iowa State Offense vs BYU

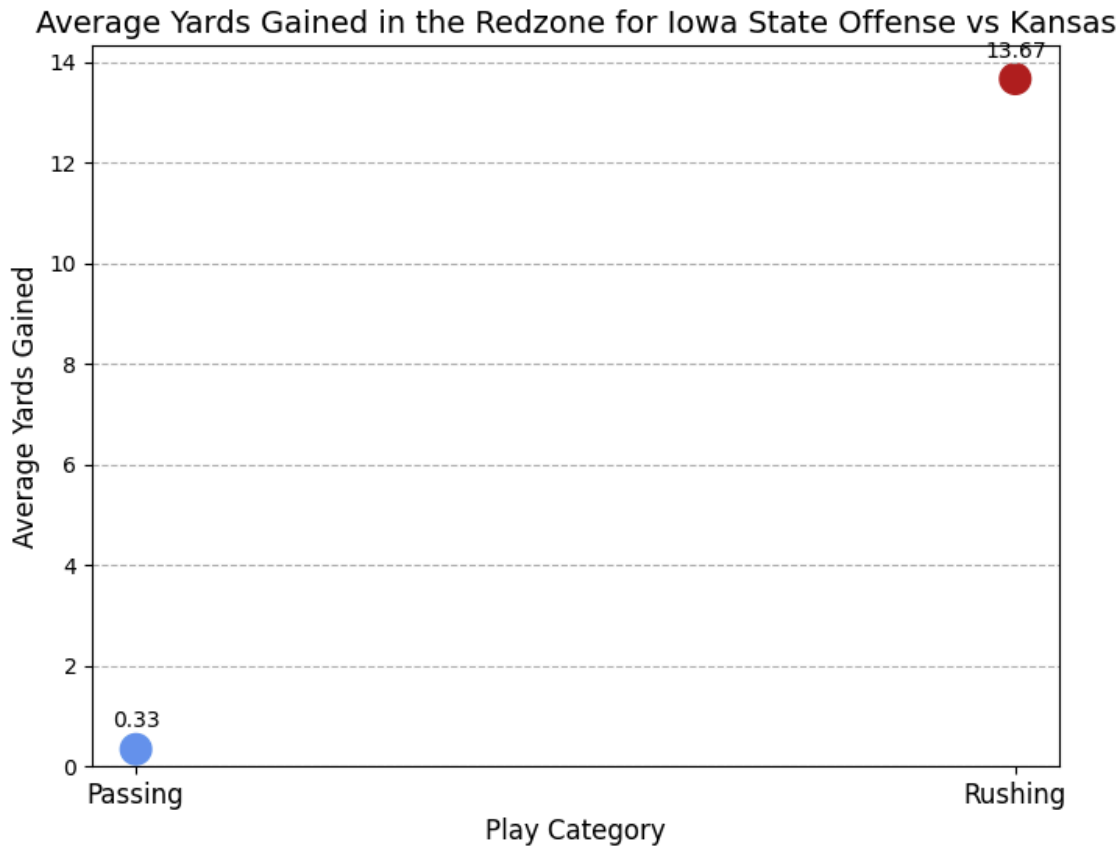


Average Yards Gained in the Redzone for Iowa State Offense vs Arizona State

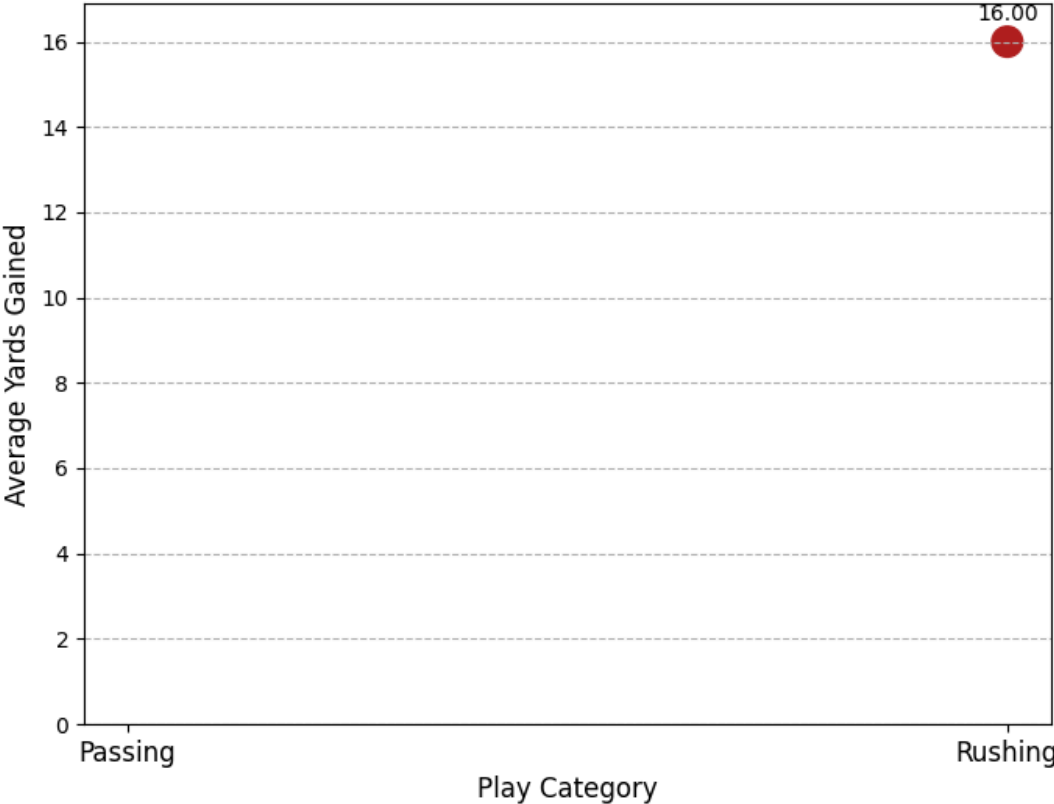








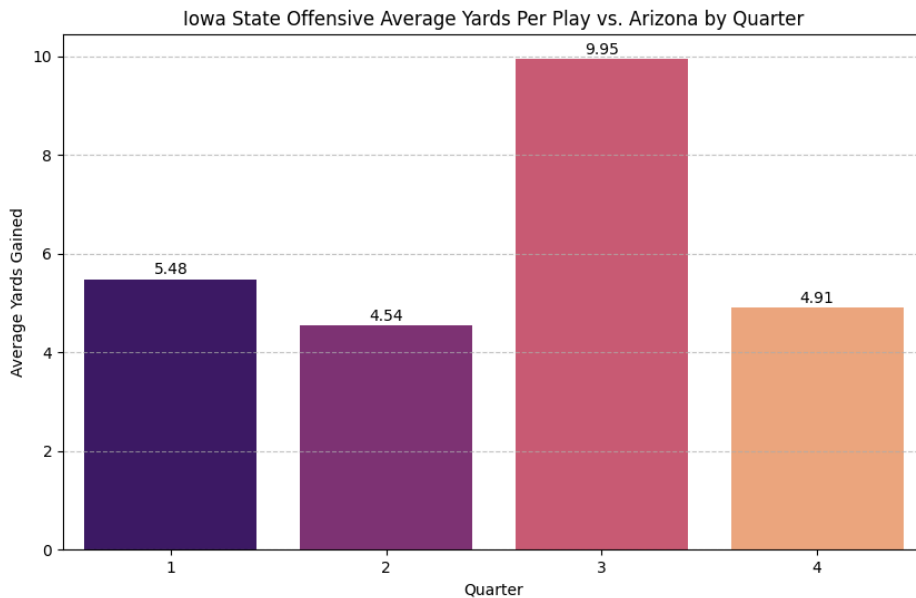
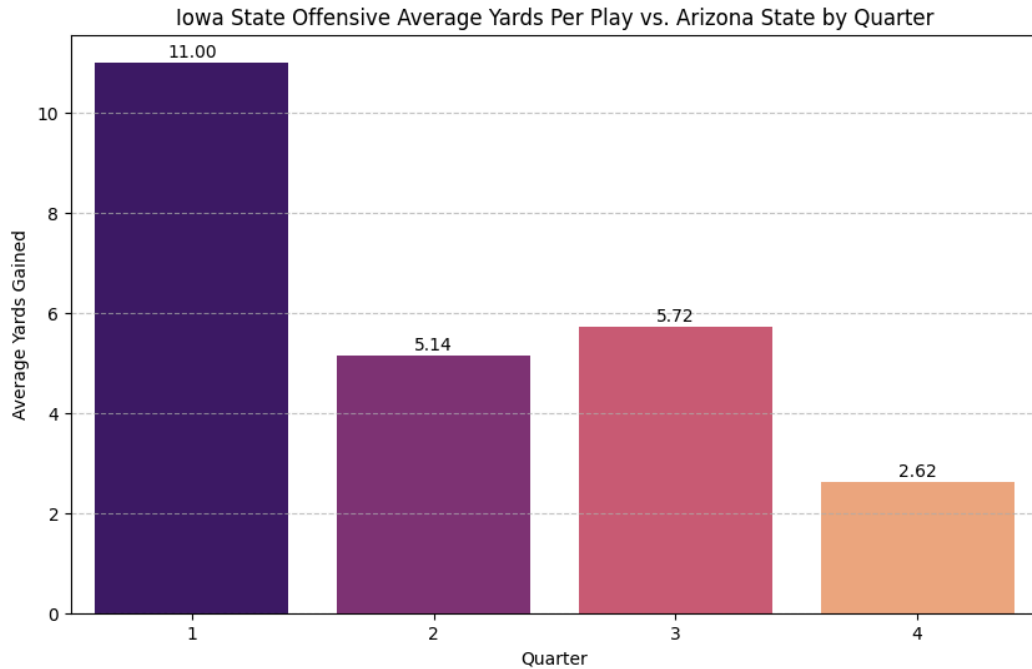
Average Yards Gained in the Redzone for Iowa State Offense vs Oklahoma State

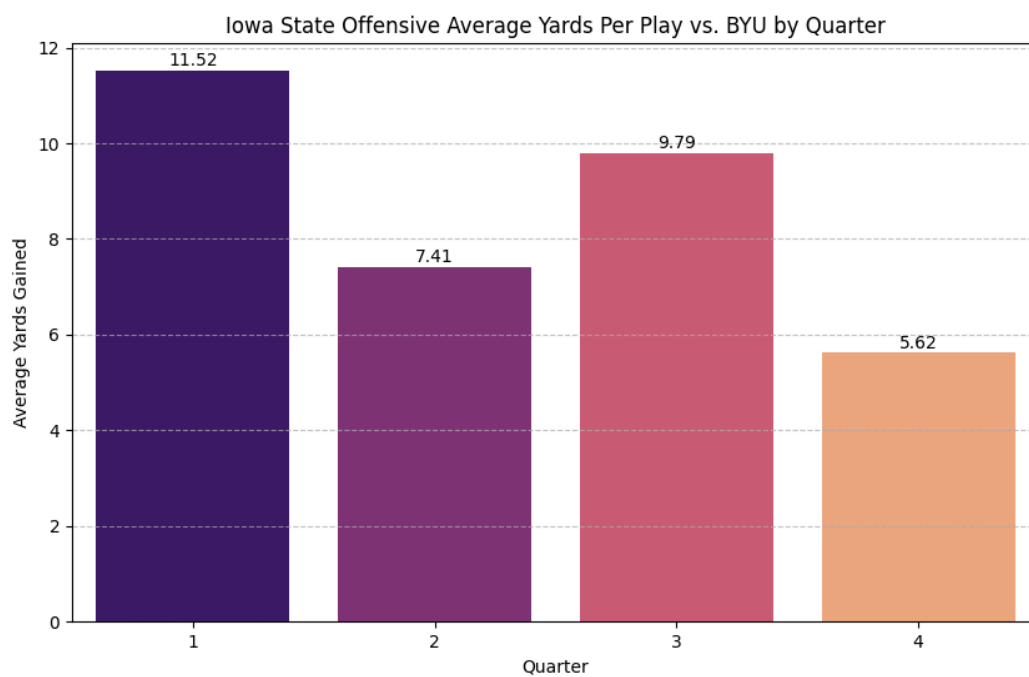
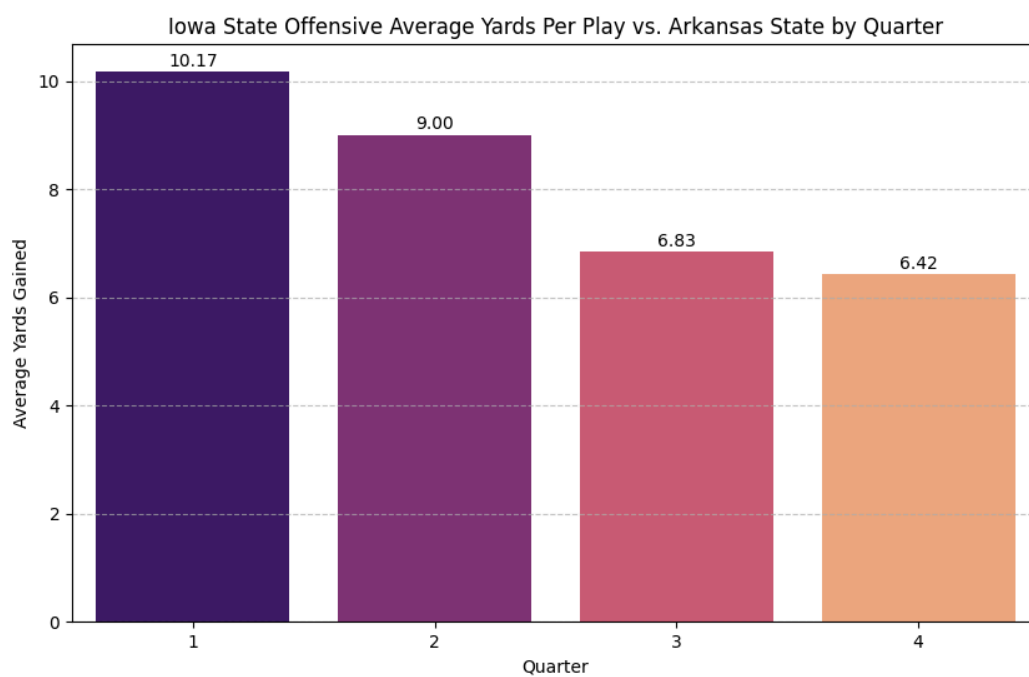


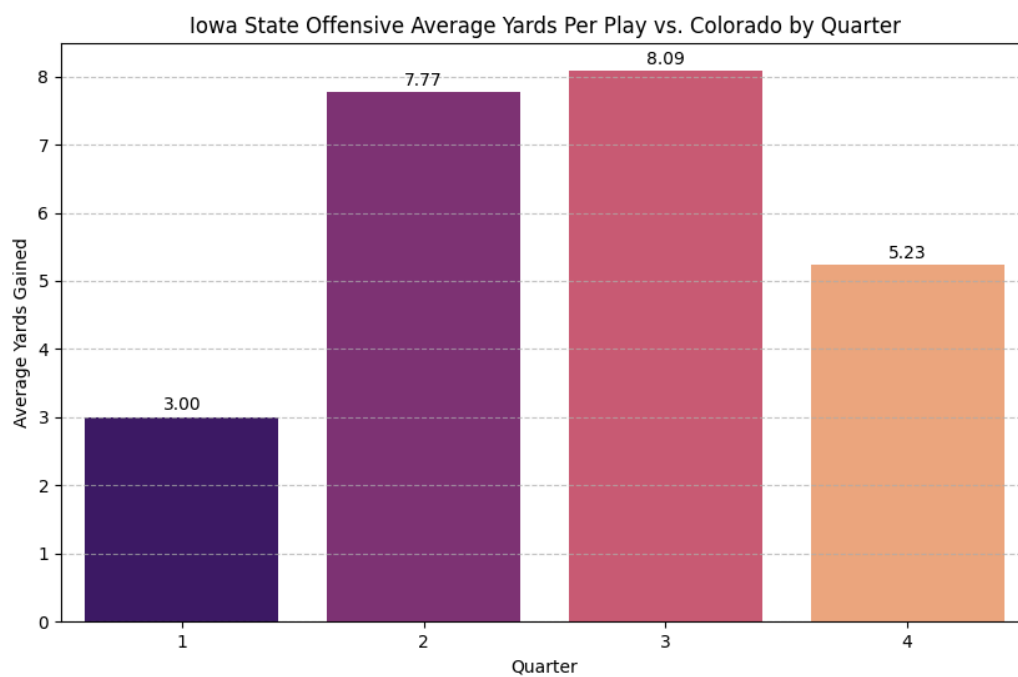
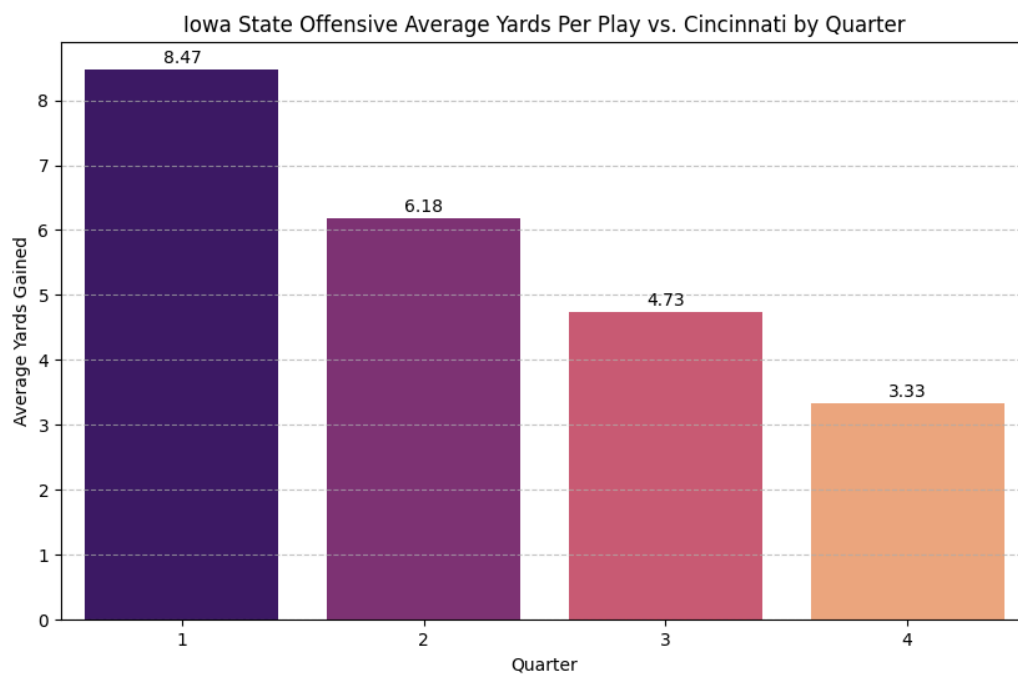
# Average Yards Per Play by Quarter

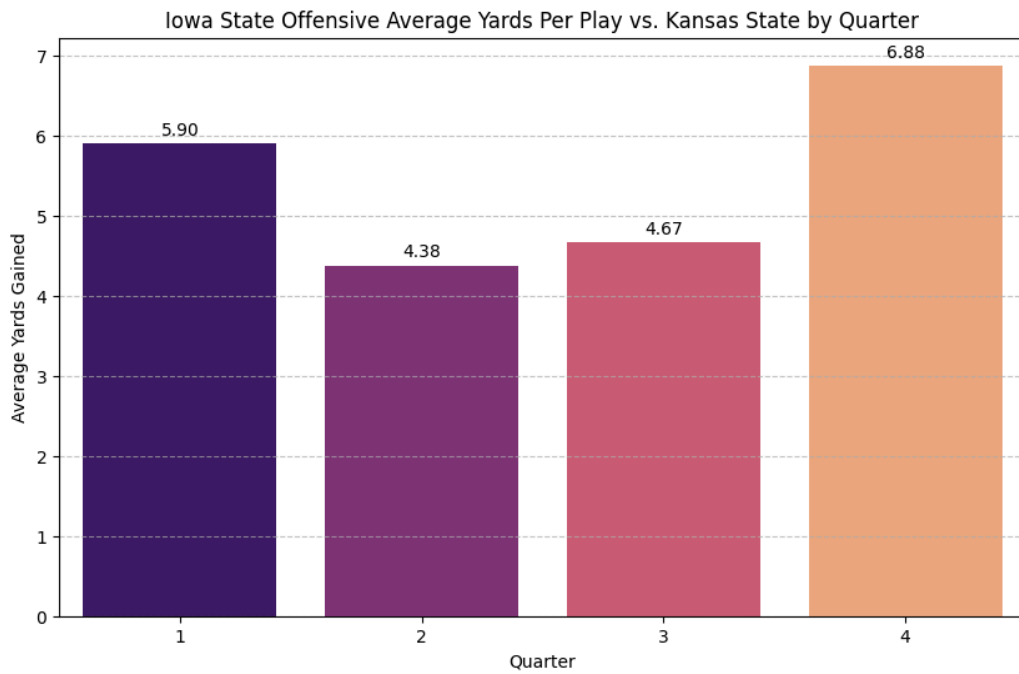
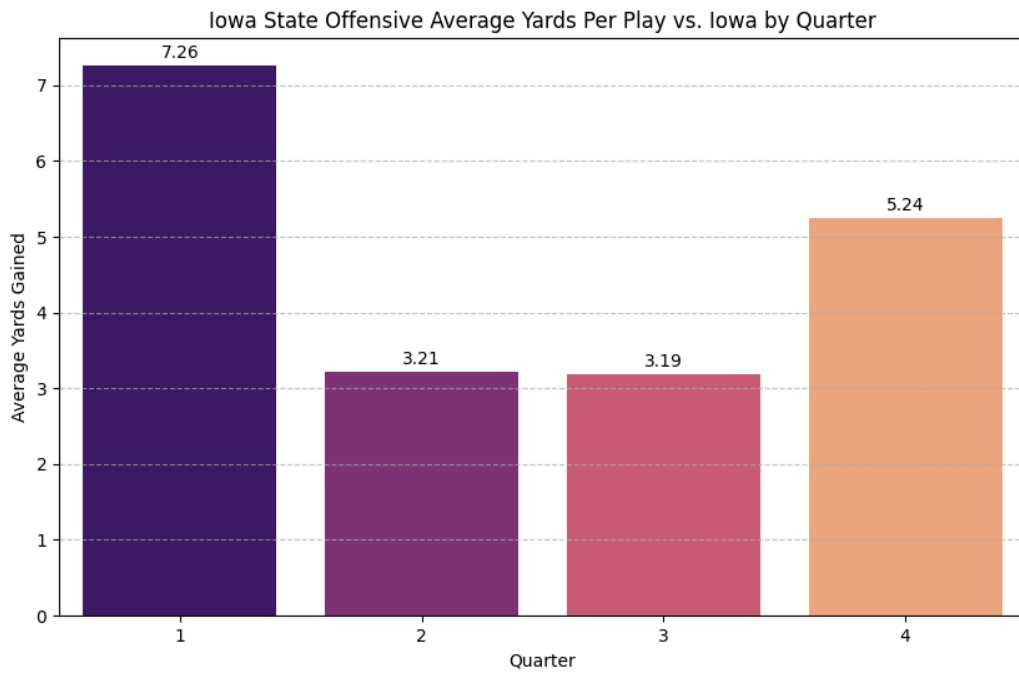
### Luke Randolph

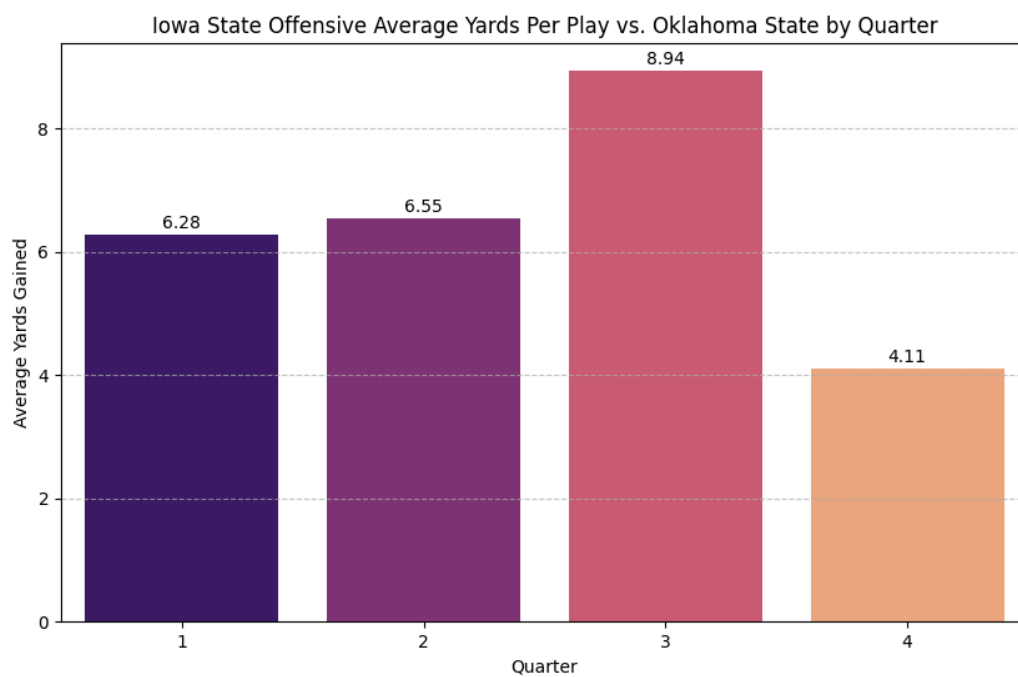
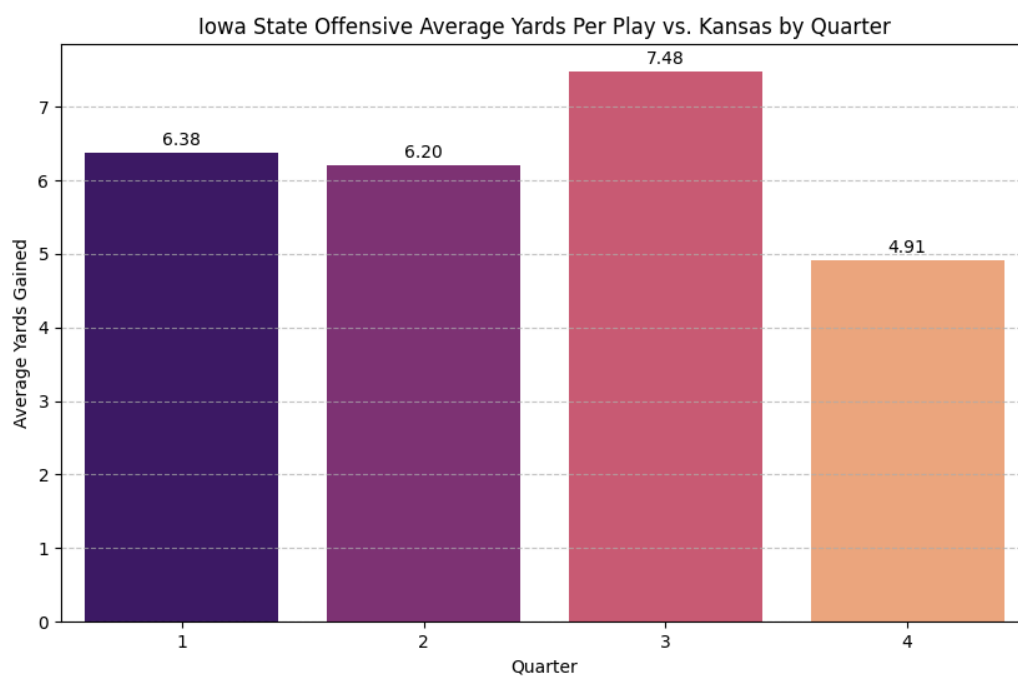
Our intention with these graphs was to determine the Iowa State Cyclones Football Team's average yards per play (AY/P) in each quarter of each game of the 2025 College Football Season. The bar graphs help us make easy observations of the data. One observation we can make from this data is in six of the twelve games, Iowa State produced the most AY/P in the first quarter. On the other hand, they averaged the lowest yards per play in the fourth quarter seven times.



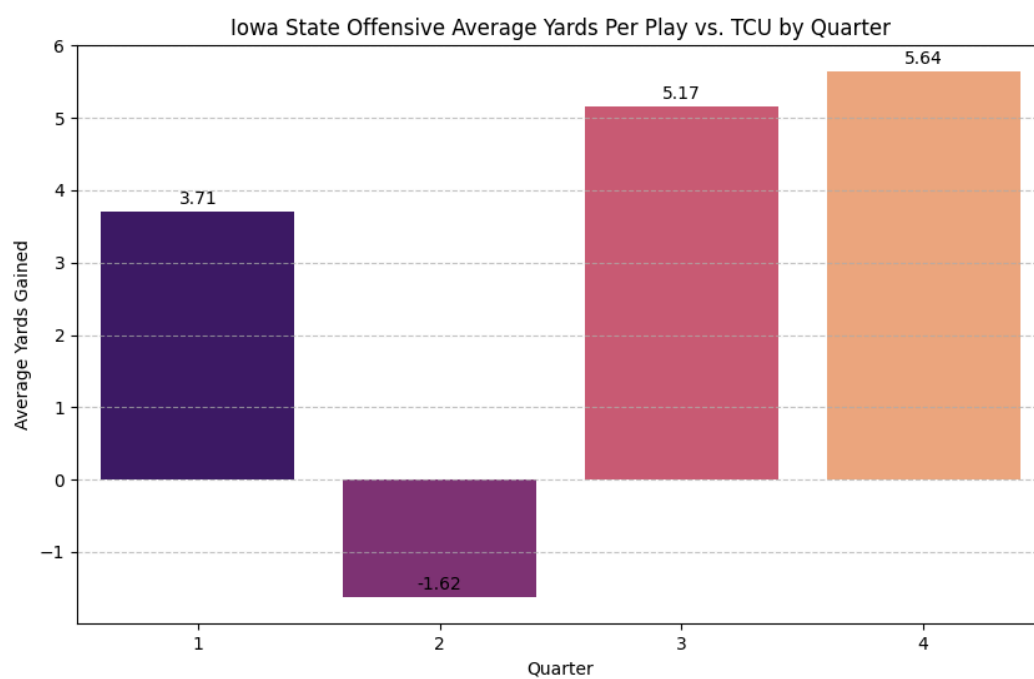
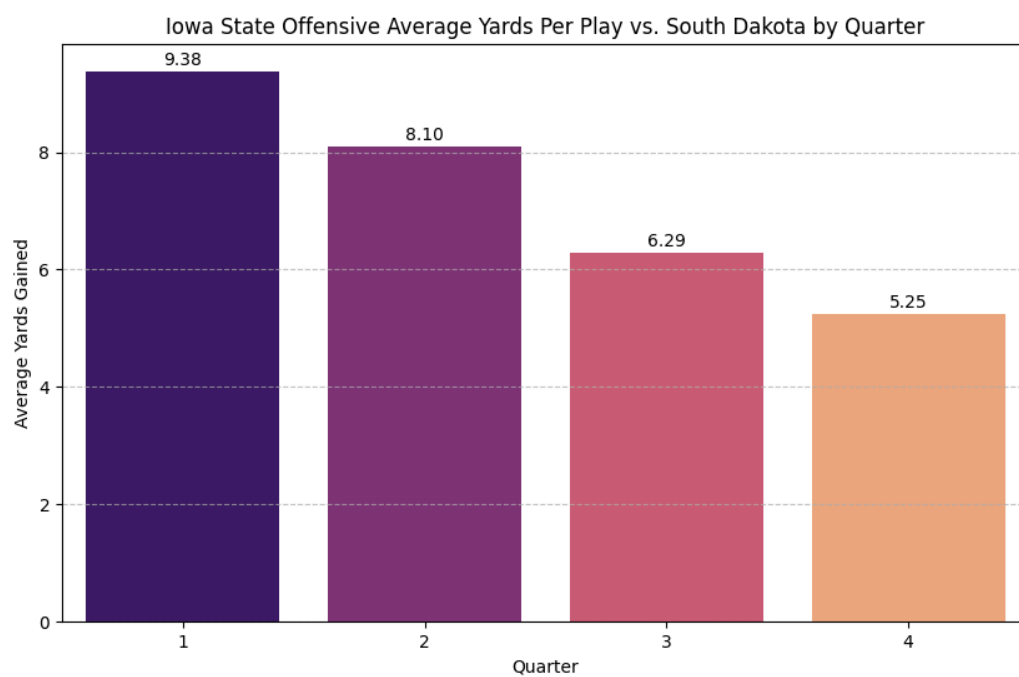






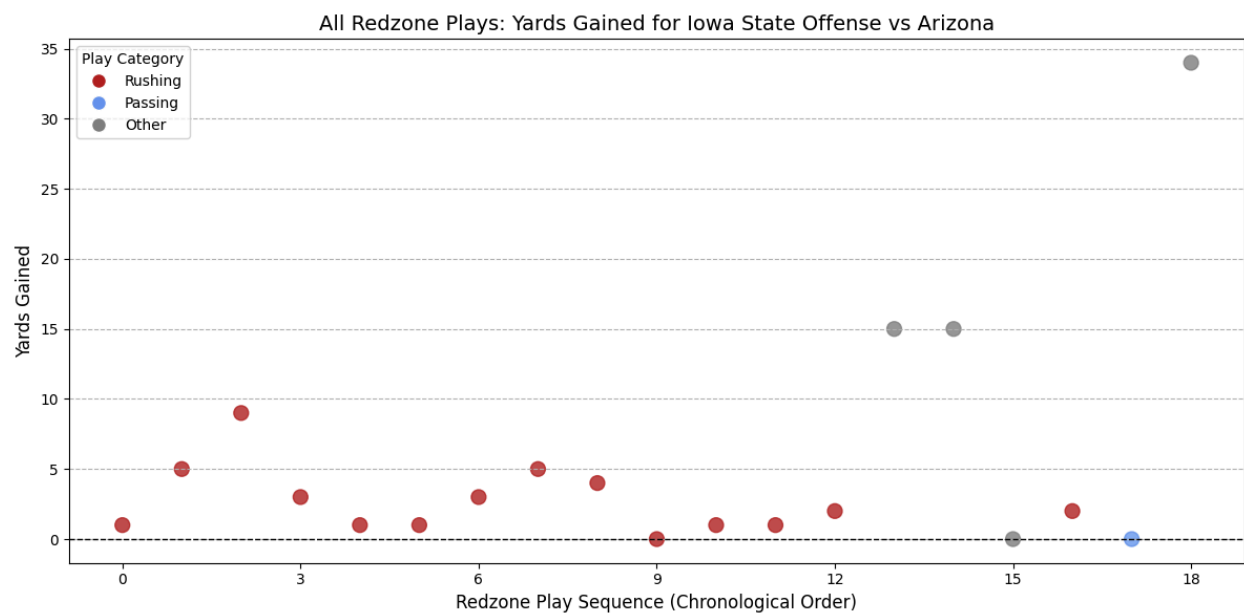
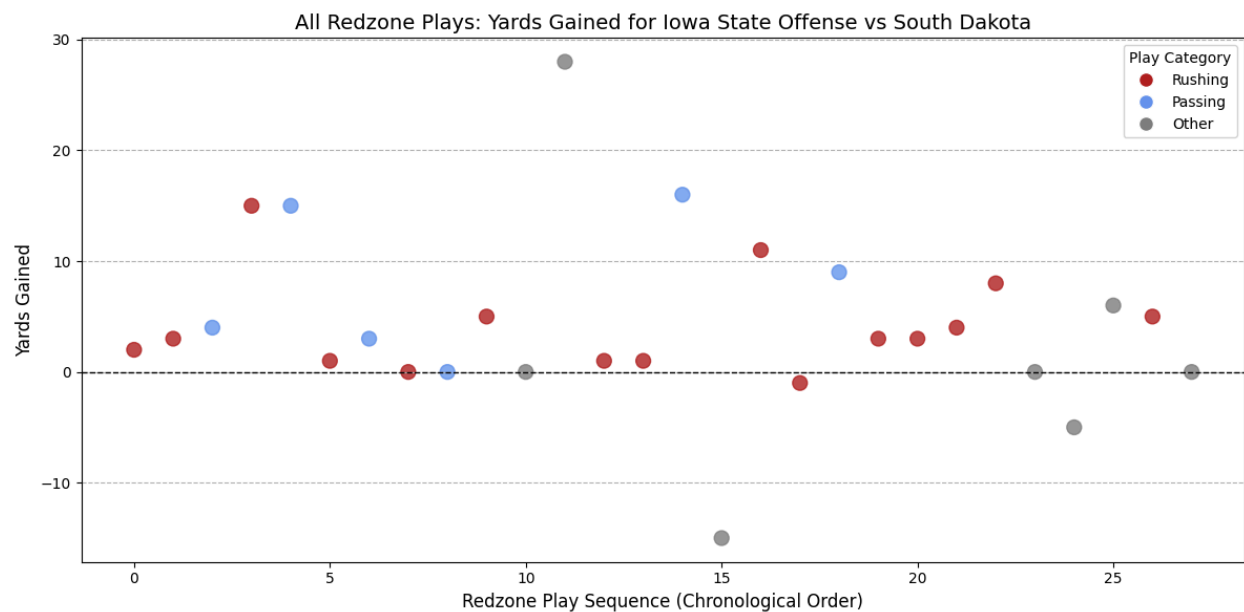


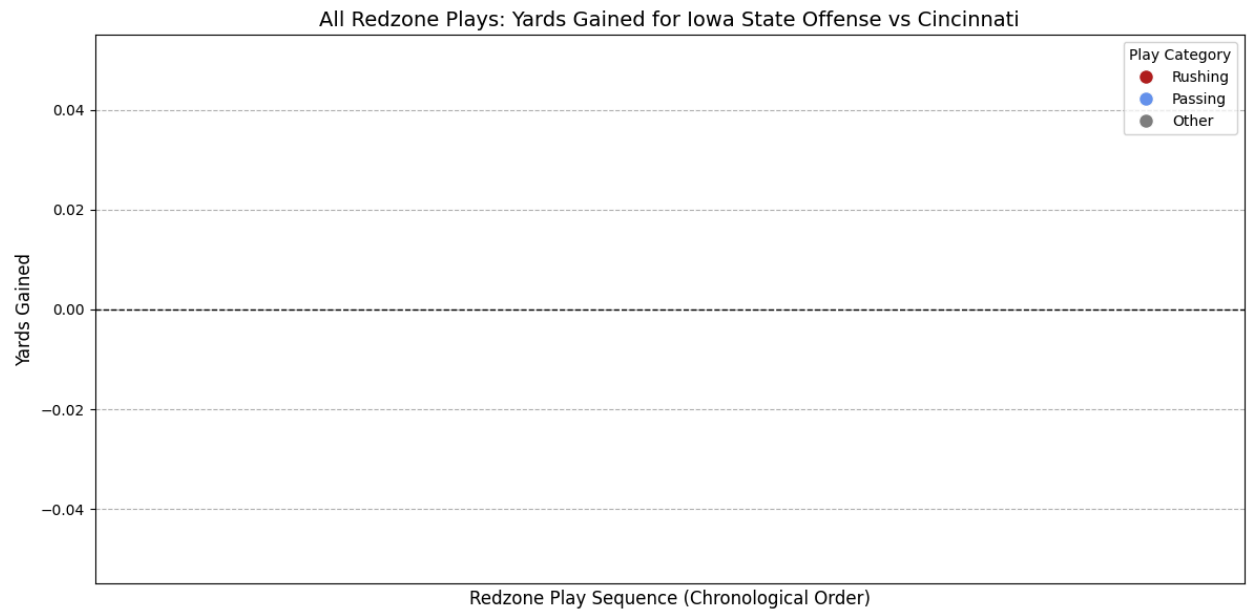
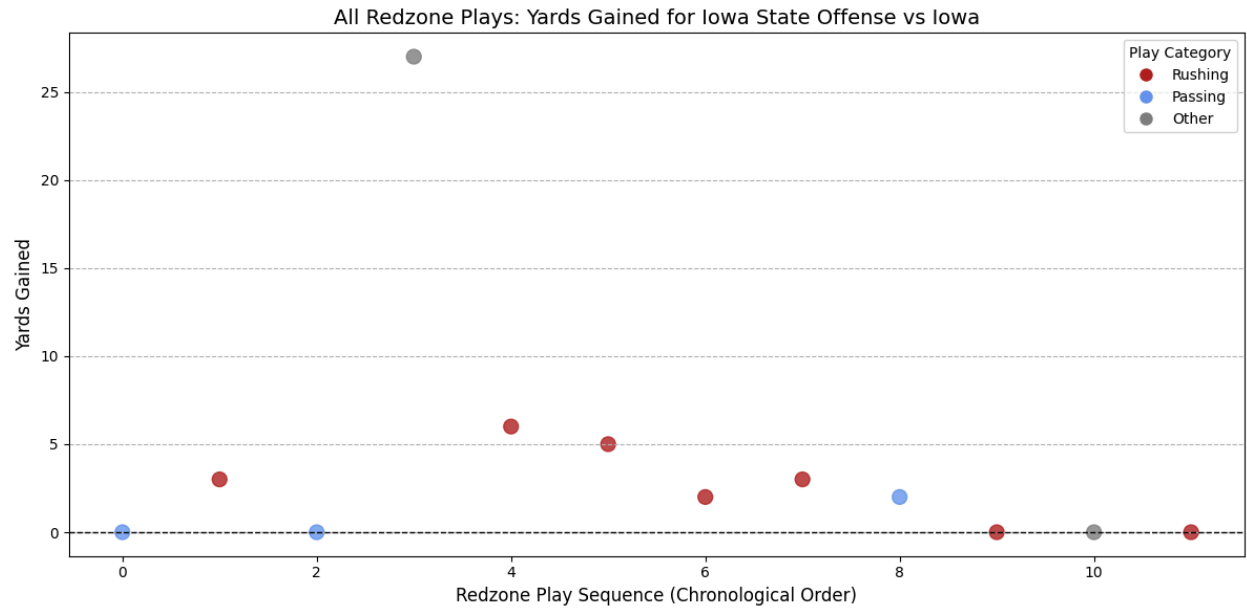


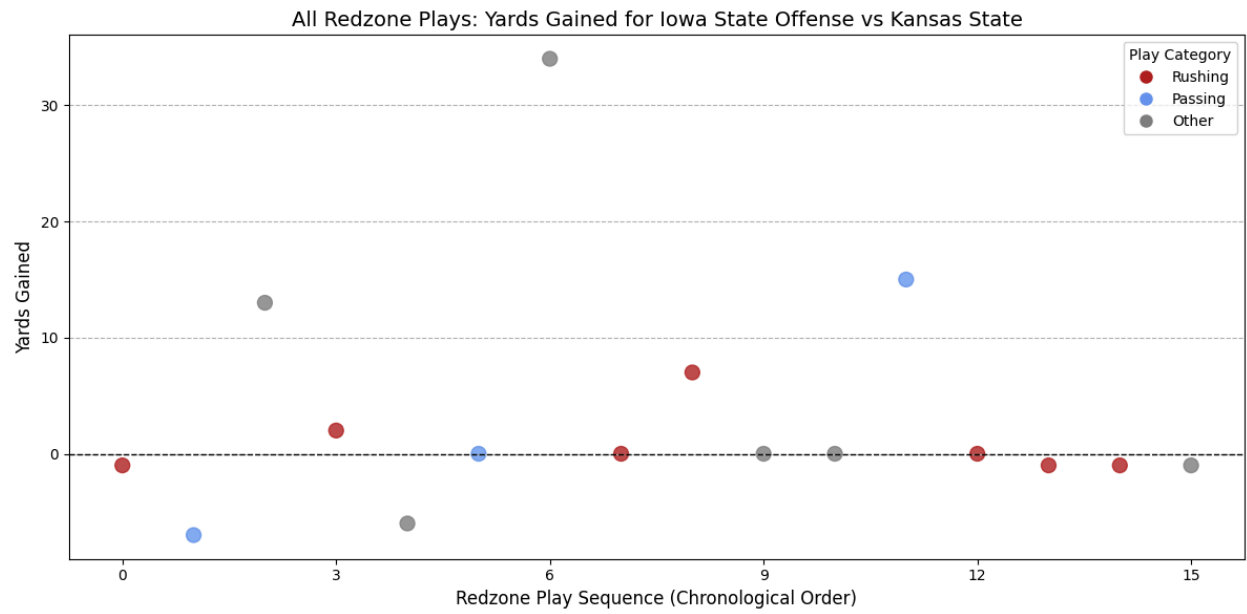
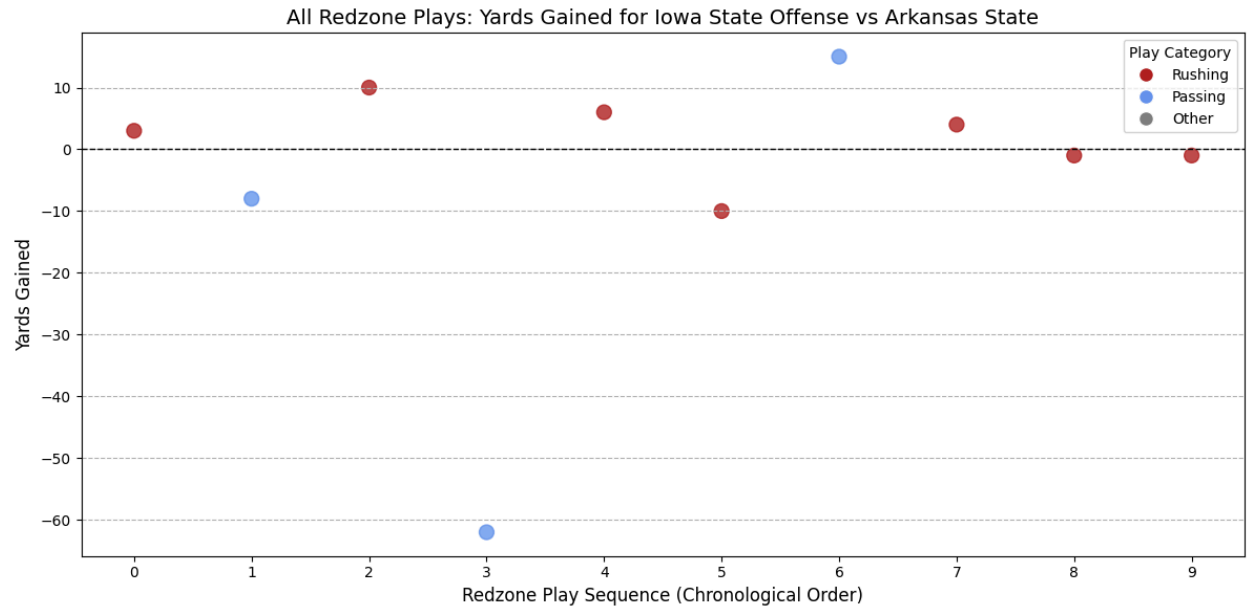


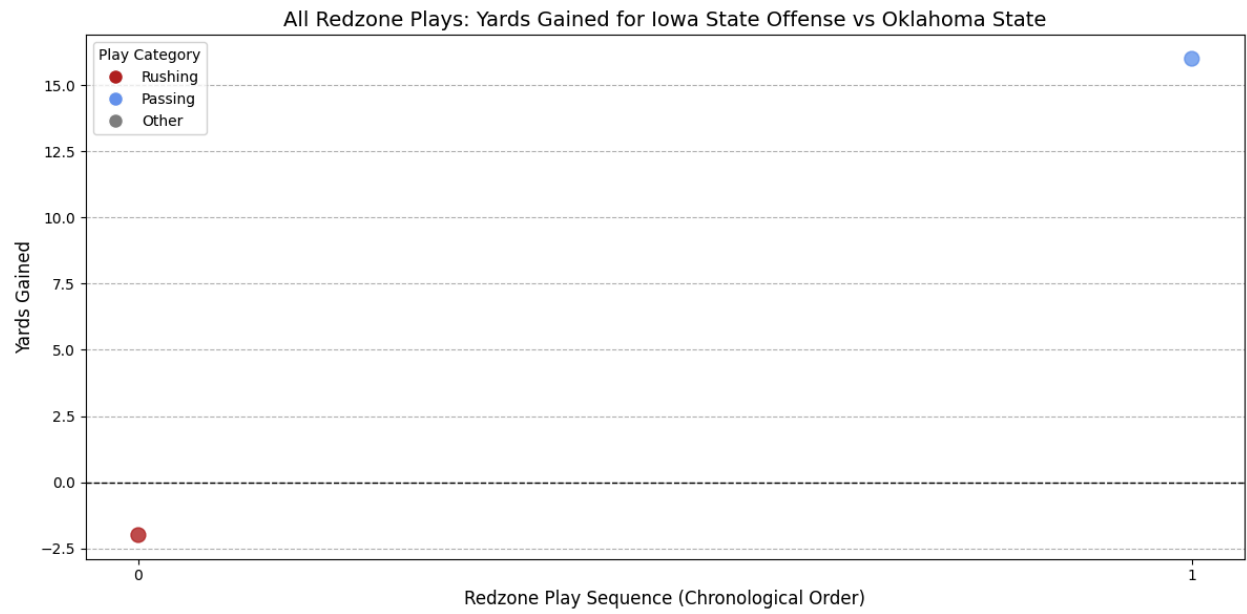
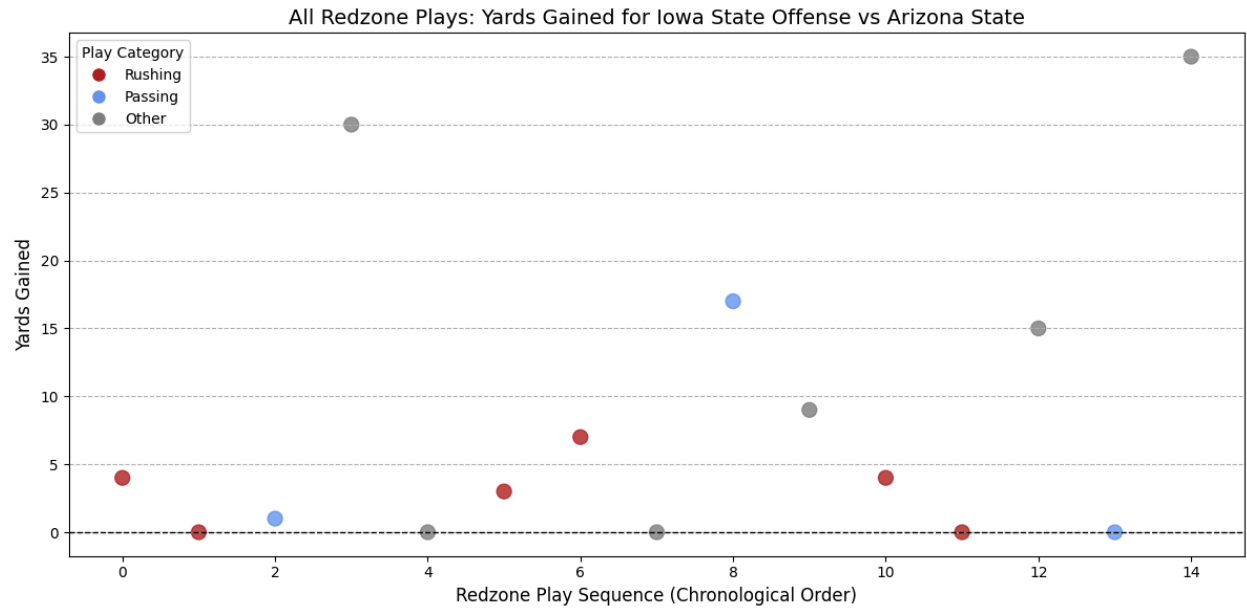
All redzone plays

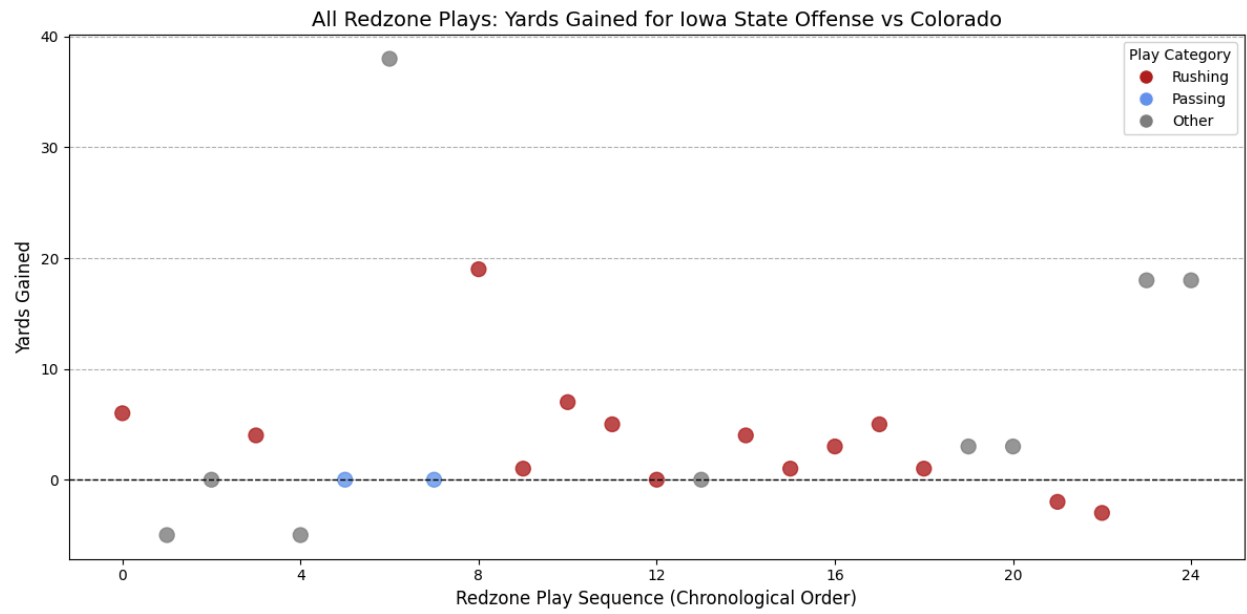
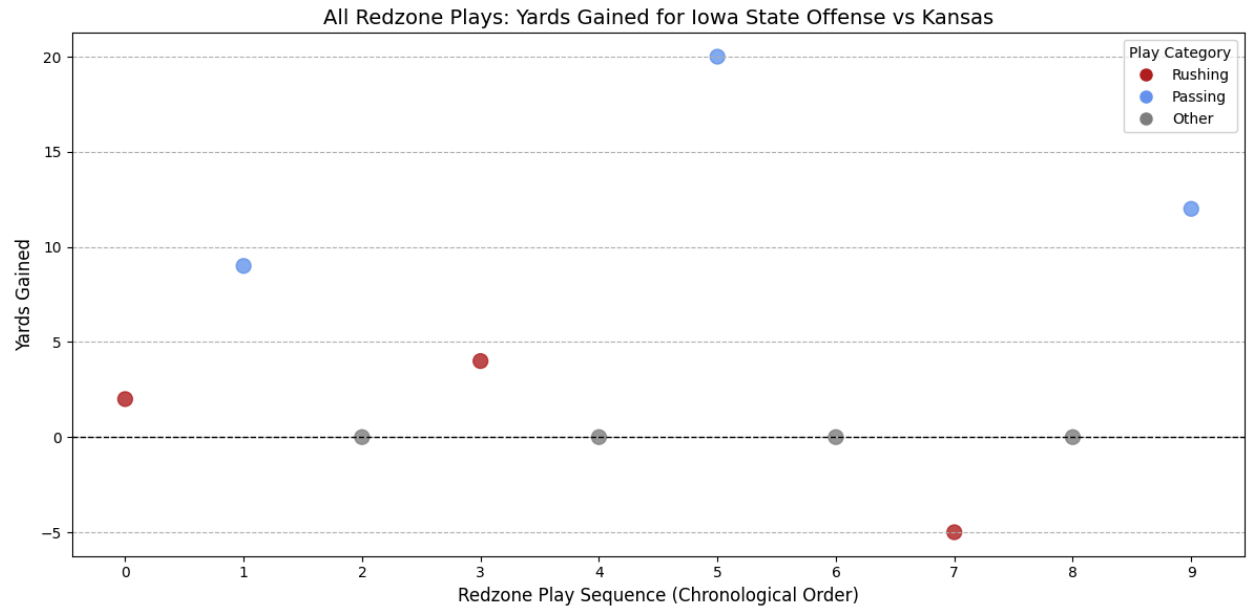
The purpose of this graph was to visualize the yards gained in the red zone on different types of plays. This graph allowed us to analyze what type of red zone plays were most effective during the game, as well as segmenting which period of time was the most efficient.

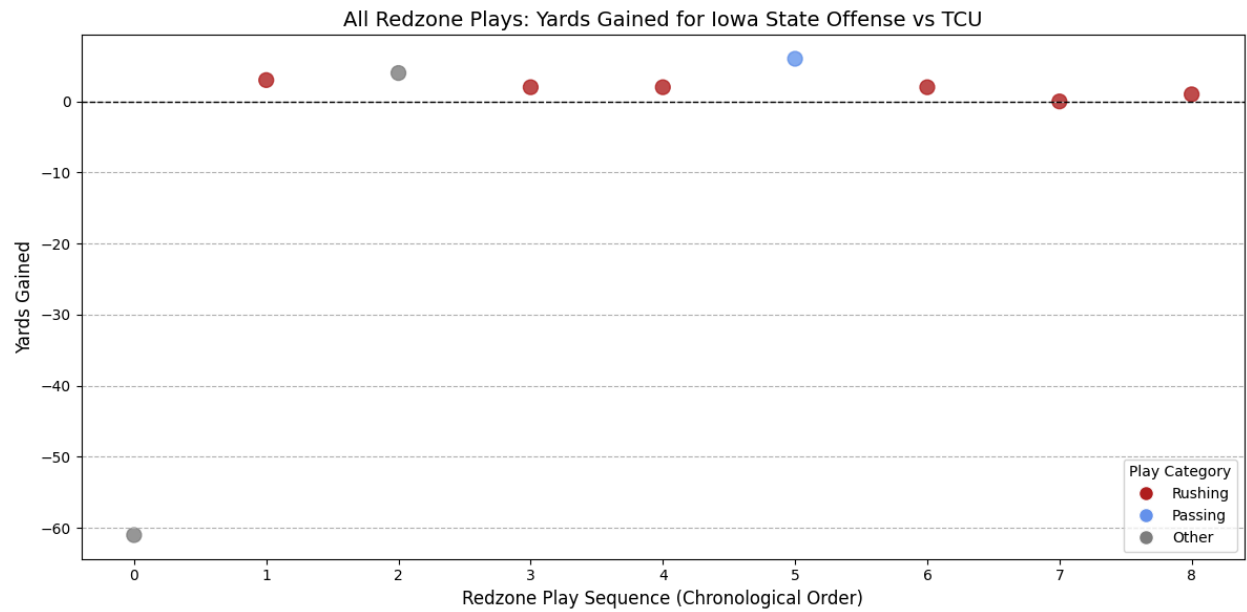
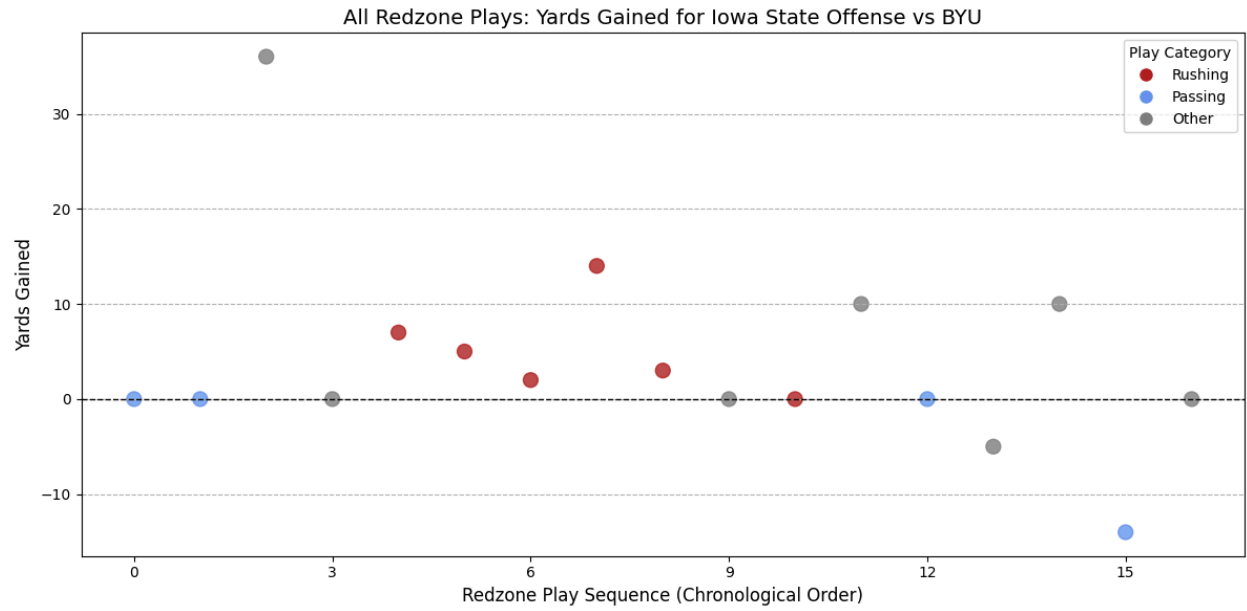














# Documentation

We obtained our data through our data source with access from an API key.

Data source: [collegefootballdata.com](https://collegefootballdata.com)

# Python Code Notebook

This will let you see our Python code for the project.

[Link to Github Repository](#)