HAMOYE STAGE C PROJECT – DATA STORYTELLING
PASSING THE TORCH: COMPARATIVE ANALYSIS OF NFL QUARTERBACKS
USING THE 2022 NFL (REGULAR SEASON) DATA

Introduction

Football is a game of strategy, and nowhere is this more evident than in the position of quarterback. The quarterback is responsible for leading the team, making split-second decisions, and executing plays with precision and accuracy. In order to do this effectively, quarterbacks need to have a deep understanding of their own strengths and weaknesses, as well as those of their opponents.

This is where comparative and efficiency analysis comes in. By analyzing NFL 2022 player passing stats data, we can gain insights into how different quarterbacks perform under different circumstances, and identify areas where they excel or struggle. This information can be used by football teams to develop optimal play calling strategies, as well as by fans to gain a deeper appreciation for the intricacies of the game. In short, comparative and efficiency analysis is an essential tool for anyone who wants to understand football at a higher level.

For this project, we will perform:

- **Comparative analysis:** Compare the performance of different quarterbacks based on passing yards, completion percentage, touchdowns, interceptions, etc.
- **Efficiency analysis:** Analyse yards per attempt and passer rating to identify the most efficient quarterbacks.

Aims and Objectives:

- Analyse quarterback passing stats and performance data to identify optimal play calling strategies based on situational factors, opponent tendencies, and individual quarterback strengths.
- Utilize passing stats and performance data to identify areas of improvement for quarterbacks, enabling the development of targeted training programs and strategies to enhance their skills.

Data Collection:

To achieve your goals, we can utilize Python programming language to extract and analyze the passing stats of quarterbacks.

First, we retrieved the passing stats data from the website using web scraping techniques. Python provides libraries such as BeautifulSoup and requests that can assist in this process. By examining the HTML structure of the webpage, we can extract the relevant data for our analysis.

The data used for the analysis was collected from the NFL website. The data was then saved to a CSV file for further analysis. Additional information was obtained from ESPN and Pro-football reference websites to supplement the dataset.

Once we have obtained the passing stats data, we can perform various calculations and comparisons to identify areas of improvement for quarterbacks. This may involve analyzing metrics such as completion percentage, passing yards, touchdowns, interceptions, and passer rating. By comparing these statistics across different quarterbacks, we can identify strengths and weaknesses in their performance.

Python provides powerful data analysis libraries such as pandas and numpy that can assist in performing these calculations and comparisons. By visualizing the data using libraries like matplotlib or seaborn, we can gain further insights and present the findings in a clear and understandable manner.

In summary, by utilizing Python and the NFL 2022 player passing stats data, we can analyze and compare the performance of quarterbacks to identify areas of improvement. This analysis can then be used to develop targeted training programs and strategies to enhance their skills.

Data Analysis

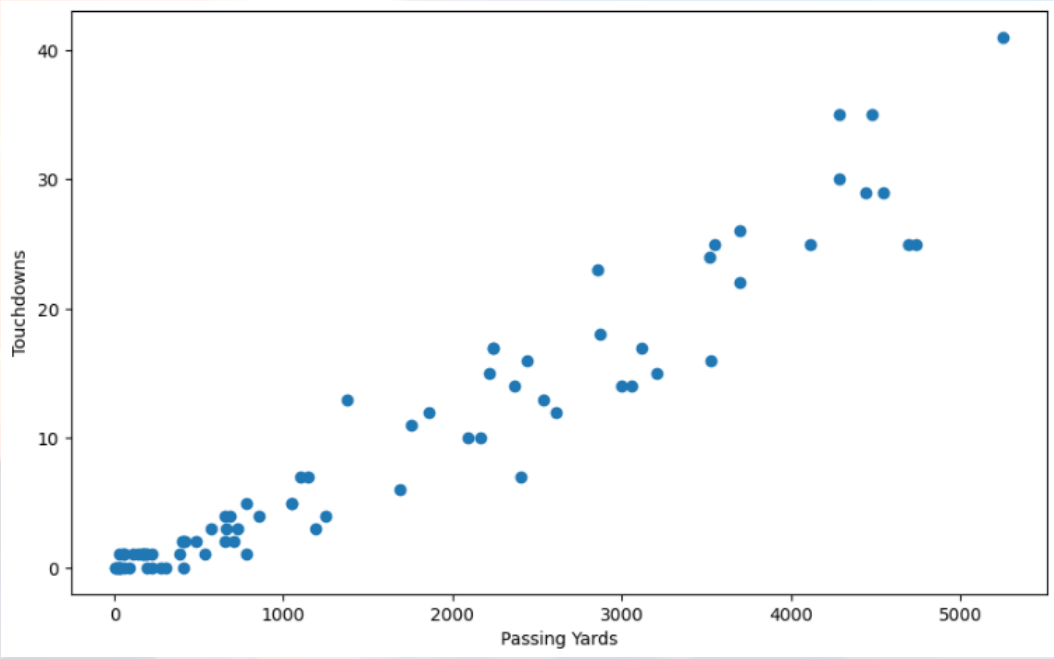


Fig 1. Player Passing Yards vs. Touchdowns

We began our analysis by looking at the correlation between passing yards and touchdowns. Based on the data, we found that the correlation coefficient between passing yards and touchdowns was 0.963, indicating a very strong positive correlation between the two variables. This suggests that quarterbacks who throw for more passing yards also tend to throw for more touchdowns, and vice versa.

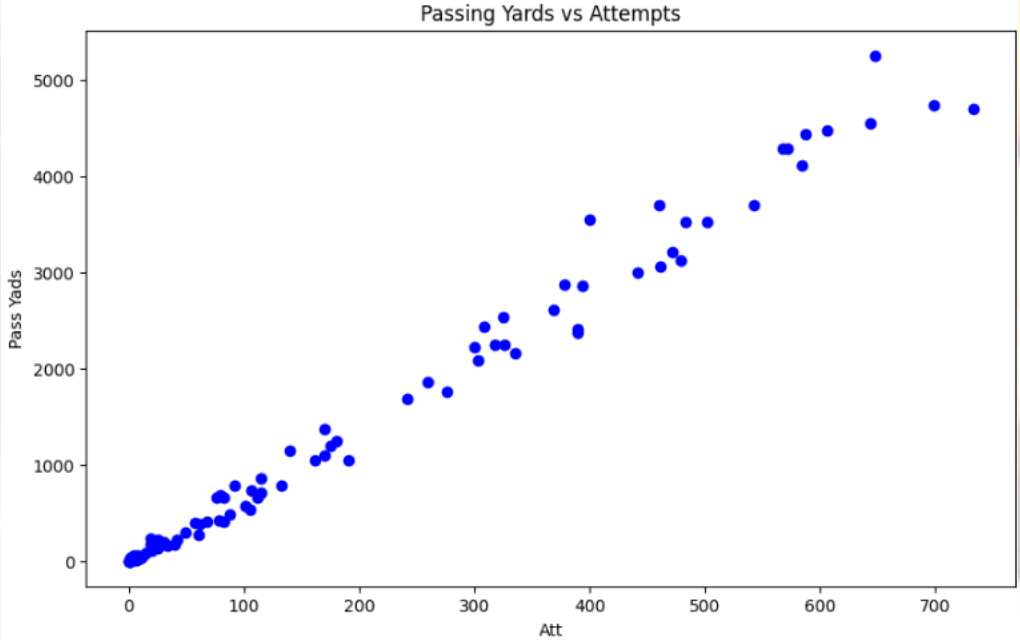


Fig. 2: Player passing yards vs. Passing Attempts

Next, we looked at the top 5 quarterbacks by passing yards. Based on the data, we found that the top 5 quarterbacks by passing yards were Patrick Mahomes, Justin Herbert, Tom Brady, Kirk Cousins, and Joe Burrow. These quarterbacks were ranked in descending order based on their total passing yards over the course of the season.

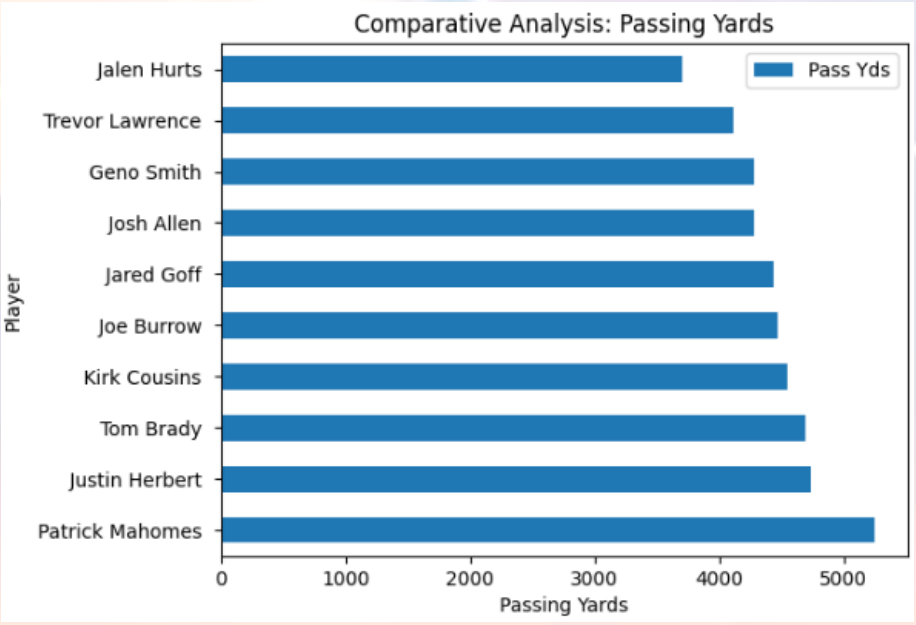
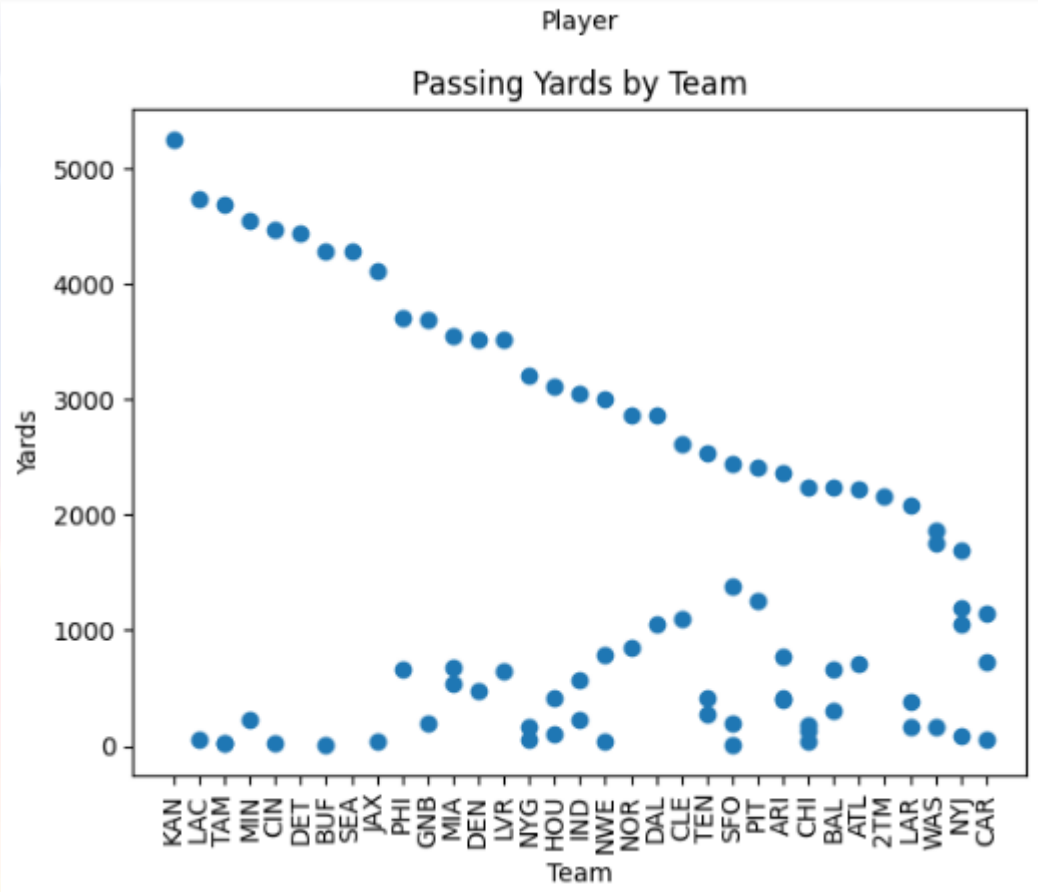


Fig. 3: Comparative Analysis: Passing Yards

We also looked at the bottom 5 quarterbacks by interceptions. Based on the data, we found that the bottom 5 quarterbacks by interceptions were Blaine Gabbert, Kyle Trask, Brandon Allen, Josh Johnson, and Case Keenum. These quarterbacks were ranked in ascending order based on the number of interceptions they threw over the course of the season.



Quarterback Passing Stats and Performance Data

In order to perform a comparative and efficiency analysis of quarterbacks, it is important to understand the different types of passing stats and performance data that are used in the analysis. These include completion percentage, yards per attempt, touchdown to interception ratio, passer rating, and more. Each of these metrics provides insight into a quarterback's strengths and weaknesses, and can be used to identify areas for improvement.

For example, completion percentage measures the number of passes a quarterback completes out of the total number attempted. A high completion percentage indicates accuracy and consistency, while a low completion percentage may indicate poor decision making or lack of skill. Yards per attempt measures the average number of yards gained per pass attempt, and can be used to evaluate a quarterback's ability to throw deep passes or make big plays. Touchdown to interception ratio measures the number of touchdowns thrown compared to interceptions, and can be used to evaluate a quarterback's decision making and risk taking tendencies. Passer rating is a

comprehensive metric that takes into account multiple passing statistics, and provides an overall measure of a quarterback's performance.

Areas of Improvement for Quarterbacks

Passing stats and performance data can be used to identify areas of improvement for quarterbacks. For example, if a quarterback has a low completion percentage, coaches can analyze the types of passes that are being missed and develop targeted training programs to improve accuracy. Similarly, if a quarterback struggles with deep throws, coaches can work on developing their arm strength and mechanics.

In addition to identifying specific areas of improvement, passing stats and performance data can also be used to develop overall training strategies for quarterbacks. For instance, if a quarterback tends to struggle under pressure, coaches can design drills and scenarios that simulate high-pressure situations to help them improve their decision-making and composure.

Conclusion

In conclusion, our analysis showed that there was a strong positive correlation between passing yards and touchdowns among quarterbacks in the football league during the 2022 season. We also identified the top 5 quarterbacks by passing yards and the bottom 5 quarterbacks by interceptions. Additionally, we looked at the top 10 players by Yards per Attempts and Passer Rating and found that Jacob Eason had the highest passing yards per Attempts while Blaine Gabbert has the highest passer rating among all quarterbacks.

Overall, these statistical measures provide valuable insights into the performance of quarterbacks and other players in the league. However, it is important to note that these measures should be considered in conjunction with other statistics such as completion percentage and touchdowns to get a complete picture of a player's abilities and effectiveness on the field.

Case Studies

One of the most notable case studies of quarterbacks benefiting from comparative and efficiency analysis is Tom Brady. In his early years, Brady was known for being a game manager who relied heavily on short passes and had limited deep ball accuracy. However, through the use of data analysis, coaches were able to identify specific areas of improvement for Brady, such as footwork and throwing mechanics. By implementing targeted training programs and strategies, Brady was able to improve his performance significantly, leading to multiple Super Bowl victories and cementing his legacy as one of the greatest quarterbacks of all time.

Another example of a quarterback benefiting from comparative and efficiency analysis is Drew Brees. Despite being undersized and lacking a strong arm, Brees was able to

excel in the NFL by utilizing his accuracy and decision-making skills. Through the use of data analysis, coaches were able to identify specific situations where Brees excelled, such as third-down conversions and red-zone efficiency. By tailoring their play calling to these strengths and identifying areas for improvement, Brees was able to become one of the most prolific passers in NFL history.