



Project 2 Proposal Overview | NFL Offensive Play Analysis 2009 - 2017

Project Team | Abhishek Shetty, Bikram Khaira, Tyler Gustafson

Github Repository | https://github.com/UC-Berkeley-I-School/Project2_Khaira_Shetty_Gustafson

Primary Dataset | NFL Play by Play Data 2009 - 2017

This dataset covers all regular season plays for every NFL game between 2009 and 2017. The dataset has over 100 columns describing the circumstances around each play.

- **Link:** [Detailed NFL Play-by-Play Data 2009-2018 | Kaggle](#) - [Download Link](#)

Key Variables & Relationships we intend to explore

There are numerous relationships we can explore with this data, but we initially plan to focus on three key analytical areas. We would like to note that our areas of focus may evolve as we acquire further insights when conducting our analysis. Below you will find the three key analytical groups:

- **Analytical Group #1 | *Offensive Strategies of Specific NFL Teams over the Years***
 - *Pass Attempts vs Rush Attempts*
 - This will provide insights into teams' strategic preferences for either passing or rushing the ball and how their strategies have shifted over the decade
 - *Pass Length*
 - Team strategies can be further broken down by understanding the *PassLength* (i.e. Short, Deep) and by understanding the variable *YardsAfterCatch*
 - This approach allows us to differentiate whether teams predominantly rely on long throws or excel in maximizing yards gained through players' maneuvers after catching shorter passes
- **Analytical Group #2 | *General Impact of Game Factors (Time / Distance / Score) on Play Type***
 - *Time, Drive, YardsToGo & Score vs PlayType (i.e. pass, passlength, or run)*
 - Here we can understand how gameplay factors such as time / distance / score variables impact plays (i.e. play type)
- **Analytical Group #3 | *Impact of Home Field Advantage by NFL Teams***
 - *HomeTeam and AwayTeam*
 - Can we attribute a number of points gained for the home team? Margin of victory home vs away. What team has the best home field advantage? Who performs the worst away? Do teams make more interceptions/fumbles away?

Preliminary Plots, Figures or Tables

The following are initial charts that provide a basic overview of our data. Please note that these are preliminary, and a more comprehensive detailed analysis will be presented in the final report.

- Graphs of Pass Attempts vs Rush Attempts by Team
- Graphs of PassLength by Team



- Graphs of YardsAfterCatch by Team
- Graph of home vs away pass efficiency

Final Report Plan

Data Cleaning:

Due to the large number of columns within the dataset we intend to reduce it to a subset of the columns mentioned in the Variables section.. We intend to break up the dataset by year to compare differences in plays from year to year across the NFL and also among teams.

Final Report Goal:

The objective of our project is to conduct a comprehensive exploratory analysis aimed at understanding various NFL offensive strategies and their interaction with a range of variables.

First, we will delve into an in-depth examination of unique offensive strategies used by different NFL teams. Subsequently, we aim to analyze the influence of external variables, including the remaining time, distance to goal, and the current score, on offensive tactics. Lastly, we will investigate the role of location, particularly the concept of home-field advantage, in shaping the outcome of the game.

This holistic analysis is designed to provide a nuanced understanding of the complexities involved in NFL offensive playbooks.

Final Report Structure:

We plan on structuring our Final Project 2 Report into the three analytical buckets we have mentioned and explore the questions below with compelling analysis and supporting figures/plots/charts..

Analytical Group #1 | *Offensive Strategy of Specific Teams Over The Years*

- How do different NFL teams vary in their play strategies and success rates? Can we categorize teams based on their play styles over these specific years?
- How have offensive play types evolved over the period of time? Are certain play types becoming more / less popular?

Analytical Group #2 | *General Impact Of Game Factors (Distance / Time / Score) On Play Type*

- How does the time left in the game or half affect play selection and success rates? Are there noticeable differences in play types in different time pressures?
- How does the side of the field and yardline position affect the success rate of different play types?

Analytical Group #3 | *Impact Of Homefield Advantage By NFL Teams*

- How significant is the home-field advantage in the NFL? Does it vary by team, region, or season?
- What team has the best home-field advantage?