When we look through the years and years of data that has been used in mixed martial arts, and most importantly the Ultimate Fighting Championship (UFC), aside from the fighters’ records, fans and sports data enthusiasts have been eager to find a true, definite way to figure out who the best fighter in the world is using statistics. That is where ELO comes in. ELO is a rating system that has been perfected through trial and error of equations since it was conceived in the 1960s as a system to accurately rate chess players, and ever since then, it has been used in a variety of other sports. However, ELO is not a way to calculate just how strong of a fighter someone is because it does not consider just how one wins a match or a fight. Instead, ELO is a way to make a rating of a player or fighter using the outcomes of their past games or matches.

Using a set of data from all of the past UFC fights, we are able to make inferences about future fights by looking at a win/loss column, as well as seeing the distribution among male and female competitors. There have been over 11,000 matchups that we are viewing in our dataset, and when we look through these, we want to be able to see how many unique fights that have been recorded, and we are able to break this down even more by weight class and gender as well. Furthermore, using this data, we are able to see how much ELO can be affected and changed by upsets by analyzing the fighters rating beforehand. As we can see, when we look at data from the Ultimate Fighting Championship, there are endless ways to quantify the statistics and try to make predictions about future fights, and these are just a few of the ways that we can scratch the surface of finding the relationships between these factors.

To begin with, we can look at the fighters with the most total wins in our dataset, which we find that Donald Cerrone comes in first with 23 victories.

In order to better understand the distribution of gender among fighters, it would be in our favor to create a column in the data that factors in Gender using 'Male' and 'Female'

As I brought up earlier, there were over 11,000 different observations in our dataset, and while there have been many rematches in UFC history, we can filter down the data to just view how many unique matchups there have been in the history of professional MMA. This will allow us to view the data without seeing the rematches that have occurred between fighters.

After filtering down the data, we find that the number of unique fighting matchups that were held in the UFC is 5902. We can also take these 5902 observations and filter them down even more. By doing this, we can find just how many unique male and female fighters there have been throughout our entire set of data. Afterwards we can see that there were 1953 unique male fighters in the UFC, and 184 unique female fighters.

When we construct a table with the descending percentages of unique fights between weight classes, we see that the men's lightweight division had the largest percentage of unique fights with 18.2%, and the women's featherweight had the lowest percentage of unique matches with 0.271%. We can also find general statistics of our fighter using the given data with stats such as total victories, title bouts won, fighters average ELO score, and their win percentage in order to gauge the best fighters over the course of the UFC's history. After looking at this, we can see who is the fighter who had the greatest ELO score of all time in a fight along with what stances were the most successful in MMA fights. As I said earlier, ELO is affected by all of the past outcomes of a players matches or fights, and we can use ELO to determine what was the biggest upset in UFC history as well.

After finding these statistics about the UFC, plotting the information that is found can be a way to make the data much easier to visualize and see correlation between factors. For example, we can use ELO to try and find a correlation relating to the amount of title bouts that a fighter has won. This would show just how much the rating system can be utilized to predict future champions and winners.

Furthermore, after finding the data about the most successful stances in UFC fights, I became curious just how the outcome of fights can be correlated to which stance the fighter is using, and I wanted to see a visualization of this data in order to see it.

Throughout our analyzing of the data from all of the past UFC fights, ELO has been a crucial factor in our utilization of the data because it has allowed us to see how much of an upset a fight results in, and it shows just how highly rated fighters are going into a fight. However, after looking through the fighters stances, the question came up: does a higher ELO correlate to which fighting stance is being used?

Throughout looking at the file with over 11,000 observations about UFC fights over the years, we were able to find that Jon Jones has had the highest ELO of all UFC fighters in many of his fights and that most of the fighters with a title bout have had higher ELOs than others. Furthermore, when we analyzed the stances of fighters, we were able to discover that open stance fighters had the highest success rate at 54.2%. When analyzing the UFC, it important to break down and filter your data into the different weight classes and genders in order to not compare fighters that would never end up competing against eachother. We were able to seperate our fights into the different weight groups and see how manh unique matchups are held between each. The ELO of the fighters in the UFC is a very important metric as it is not a way to correctly identify the strength of a fighter, but it is a way to use the past outcomes of their fights in order to quantify their rating. ELO does not take into account how and what circumstances occurred during a fighters victory, but it has proven to be an excellent way to predict the outcomes of fights in the future.