Data Analysis with Python

The Best NBA Player of the 21st Century

Out of Lebron James, Kobe Bryant, and Stephen Curry, which player is the best?

Introduction

There is a long standing debate within the NBA on who is the best basketball player of the 21st century. Usually in this kind of discussion, three main superstars are heavily discussed: Lebron James, Stephen Curry, and Kobe Bryant. All three of these players have been extremely remarkable at basketball, but how can we determine who is the best?

The Data

In modern NBA times, player data is heavily recorded and published. From every modern season, the official website of the NBA has datasets which record the stats of every player for every game. All of the player datasets used in this analysis came from this Kaggle NBA collection(https://www.kaggle.com/datasets/nathanlauga/nba-games), which holds data for all the seasons from 2004-2021.

How the Graphs were Made

Python has a multitude of libraries that make visualizing complex data very straight-forward. The libraries used in this analysis were numpy(for math), pandas(for data manipulation), as well as matplotlib and seaborn for constructing all the graphs. A python IDE known as Google Colab was used to program all the graphs.

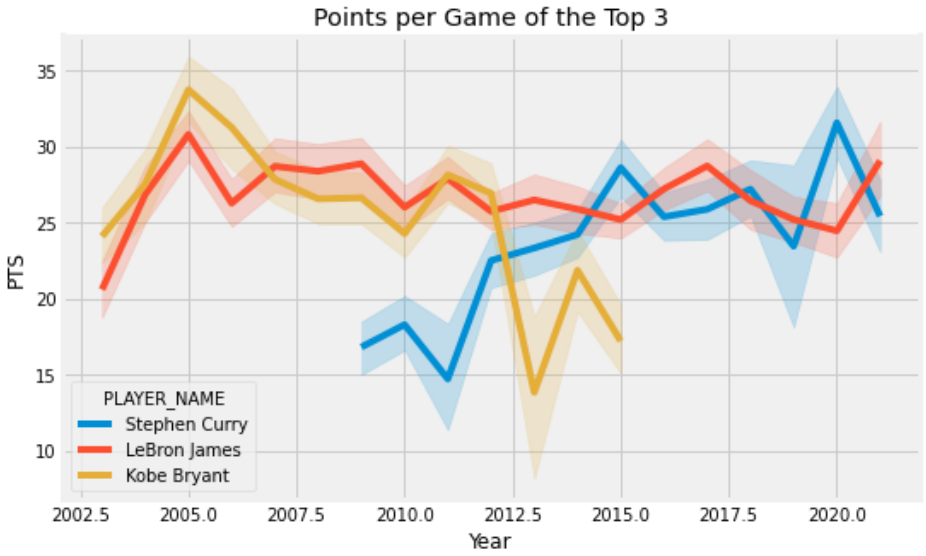
Determining the Winner

Every single graph in this report compares Lebron, Kobe, and Curry on specific stats. Each player has a score initially at 0 which measures how good of a player they are. Based on the

results of a graph, one of two things can happen: If there is one clear winner, that player alone gains one point. If there is one clear loser, the two other players gain one point each. In the end, whichever player has the highest amount of points wins.

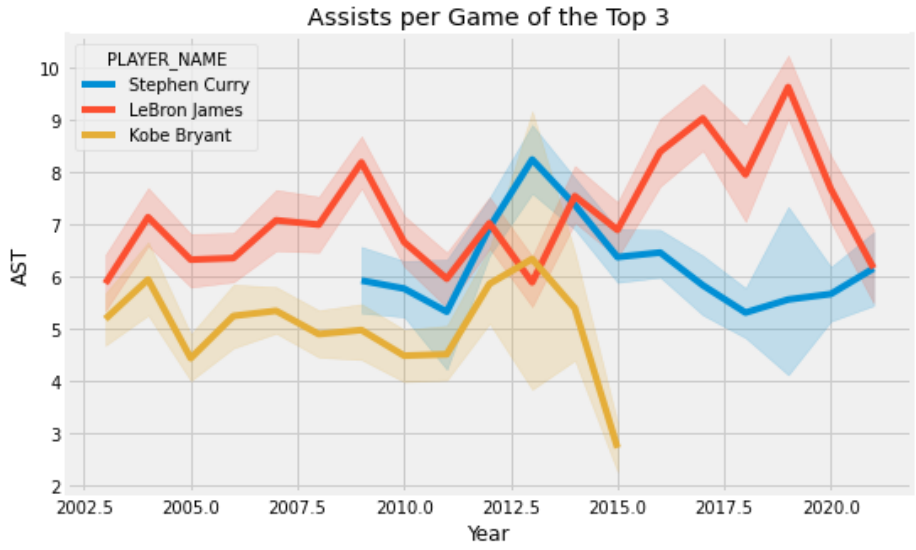
Offense

Points per Game



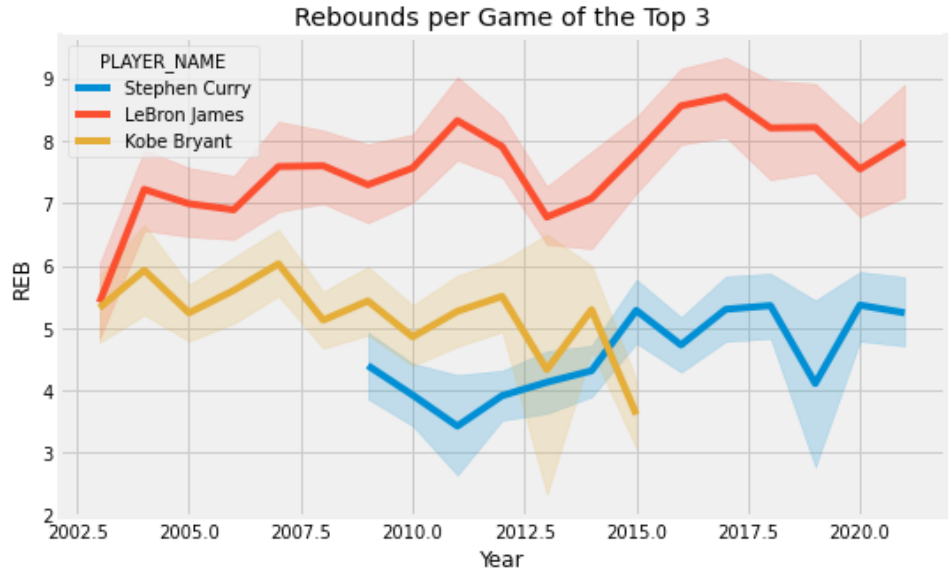
On first glance, all three players appear to be tied when it comes to points per game. Ignoring Kobe's final years as an NBA player and Stephen Curry's first years, the points are nearly identical. However, by looking closer at the distances from the mean points for every player, Lebron has the smallest distance, meaning that he has the most points per game. Therefore, Lebron gets one point. The score is currently: Curry - 0 Kobe - 0 Lebron - 1

Assists per Game



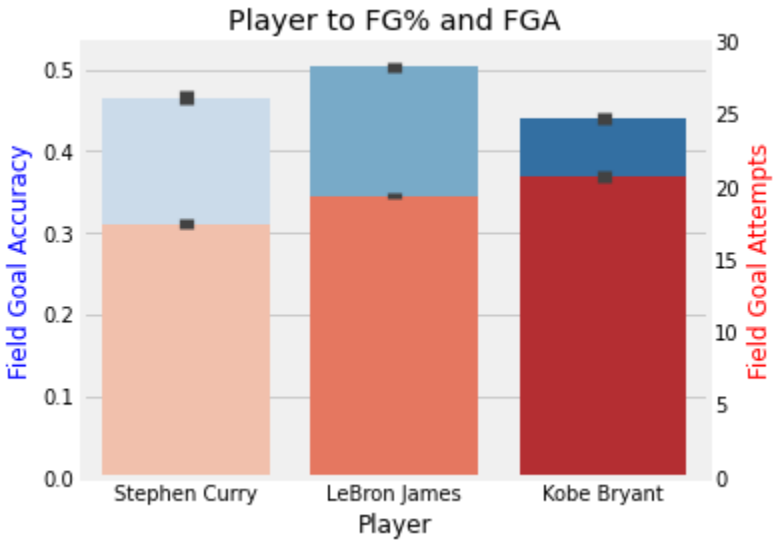
This graph conveys in a fairly obvious way that Lebron has the best assists per game out of the three players. In fact, in every single year except for 2013, Lebron has at least tied or got the most assists per game. So, Lebron gains another point. The score is currently: Curry - 0 Kobe - 0 Lebron - 2

Rebounds per Game



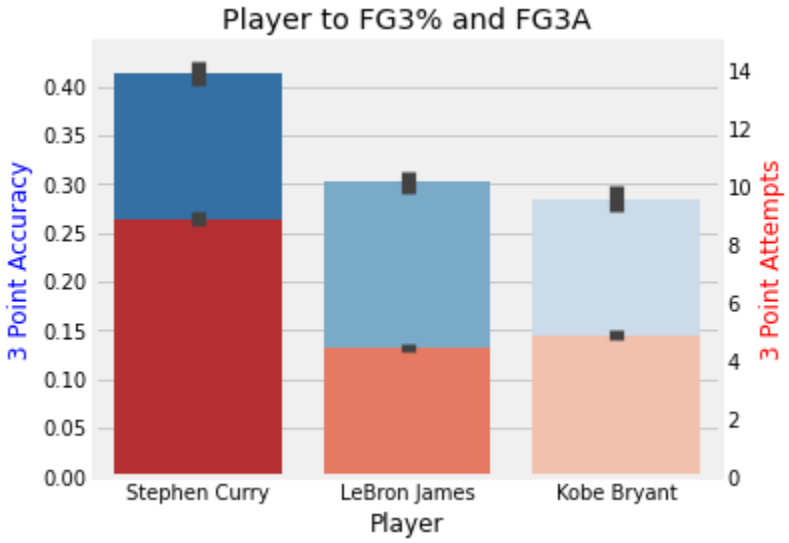
Based on the graph, it is evident that Lebron dominates Kobe and Curry when it comes to rebounds. Only in 2003 did he come close in rebounds per game to another player(Kobe Bryant). Lebron James clearly deserves a point for rebounds. The current score is Curry - 0 Kobe - 0 Lebron - 3

Field Goal Attempts and Percentage



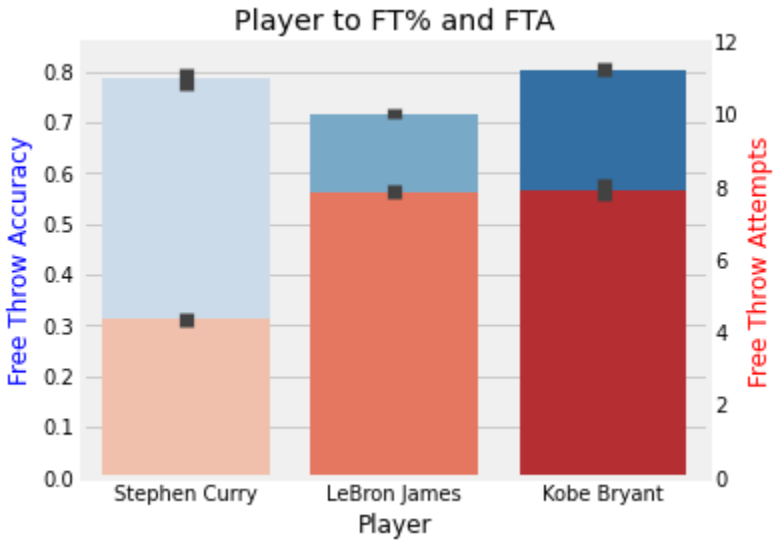
This graph displays each player's career field goal attempts and percentage, with the blue representing FG% and the red line representing field goal attempts. At a first glance, it is very unclear who the winner should be, as they all seem to have similar stats. However, when thinking about each stat based on their ranking, the results go as follows: Curry has the lowest FGA and a middle FG%, Lebron has the middle FGA and the highest FG%, and Kobe has the highest FGA and the lowest FG%. Since Lebron doesn't have the lowest in any category, he gets a point. The current score is Curry - 0 Kobe - 0 Lebron - 4

Three Point Attempts and Percentage



Simply looking at the graph for a split second will already tell the result: Stephen Curry is the clear superior when it comes to three pointers. He has both the highest attempts and the highest accuracy, both by a long shot. Therefore, Curry gets a point. The current score is Curry - 1 Kobe - 0 Lebron - 4

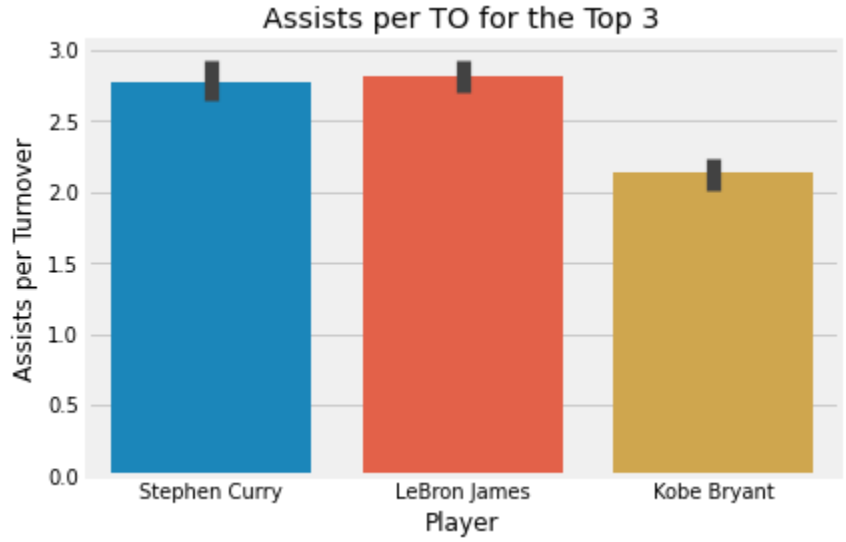
Free Throw Attempts and Percentage



Before analyzing the graph, it is important to understand that based on the way this data was made, a game with no free throw attempts counts as a 0% free throw percentage. The reasoning for this is that a player going 0-10 from the free throw line has the same free throw scoring impact as a player going 0-0.

Based on the graph, Kobe is the clear winner, as he shoots the most free throws and has the highest accuracy. Therefore, he gains a point. The current score is Curry - 1 Kobe - 1 Lebron - 4

Assists per Turnover

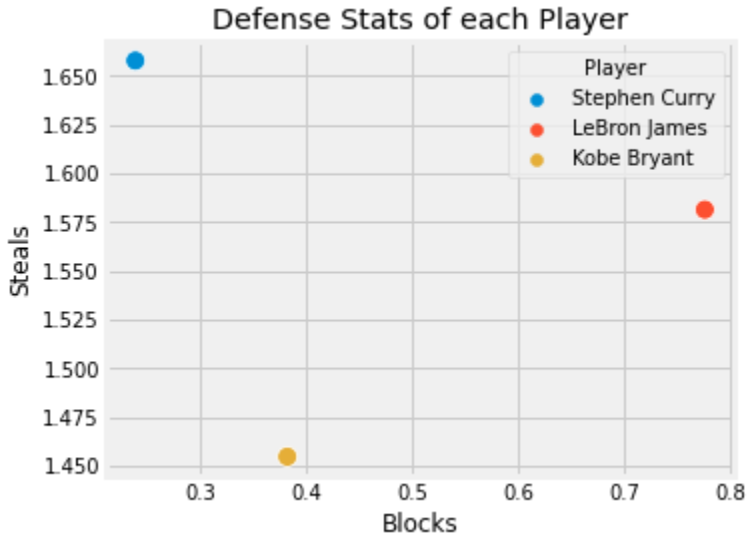


Another way to measure the impact of players assists is to compare them with their turnovers. The reasoning for this is a player with 5 assists but 8 turnovers will most likely have a more negative impact on the game than a player with 3 assists and 0 turnovers.

Based on the graph, it is fairly obvious that there is one outlier: Kobe Bryant. While Lebron and Curry both average 2.5-3 assists per turnover, Kobe only averages around 2. As a result, both Lebron and Curry get a point. The current score is Curry - 2 Kobe - 1 Lebron - 5

Defense

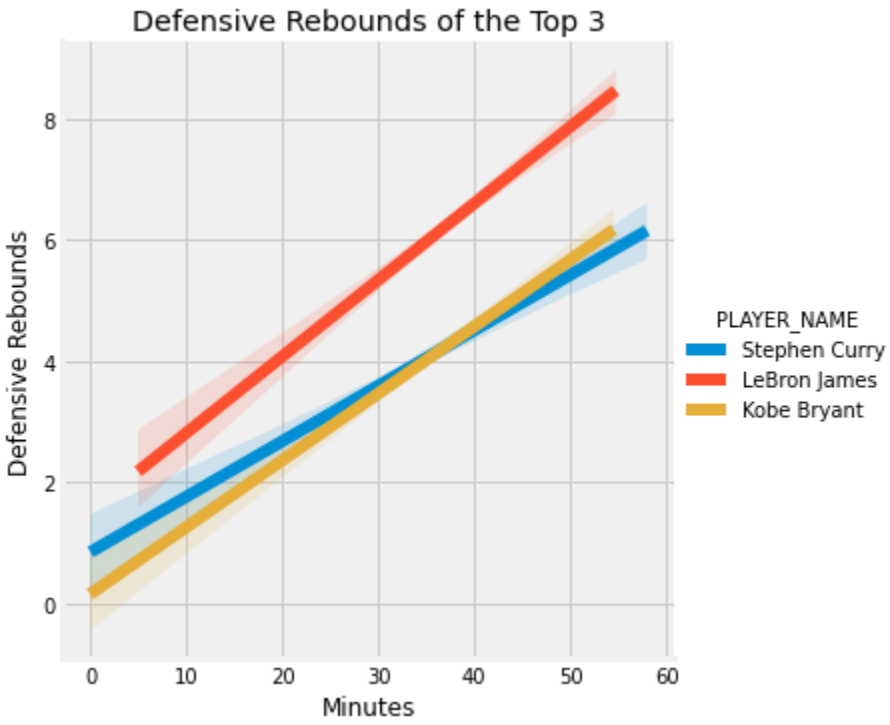
Steals and Blocks



Unlike offensive stats, defensive stats are a lot more difficult to create and visualize, as blocks and steals are the only two popular variables tracked by the NBA. However, these two variables still provide good insight into the defense skills of a player. Although they do not tell the full defensive story, a player with a high amount of steals and blocks is very likely to be a good defensive player, and vice versa.

Based on a deep study of the graph, it is clear Lebron James has the best defensive stats. While Curry is worst out of the three at blocks and Kobe is worst at steals, Lebron is not the worst at any. So, he deserves a point to his name. The current score is Curry - 2 Kobe - 1 Lebron - 6

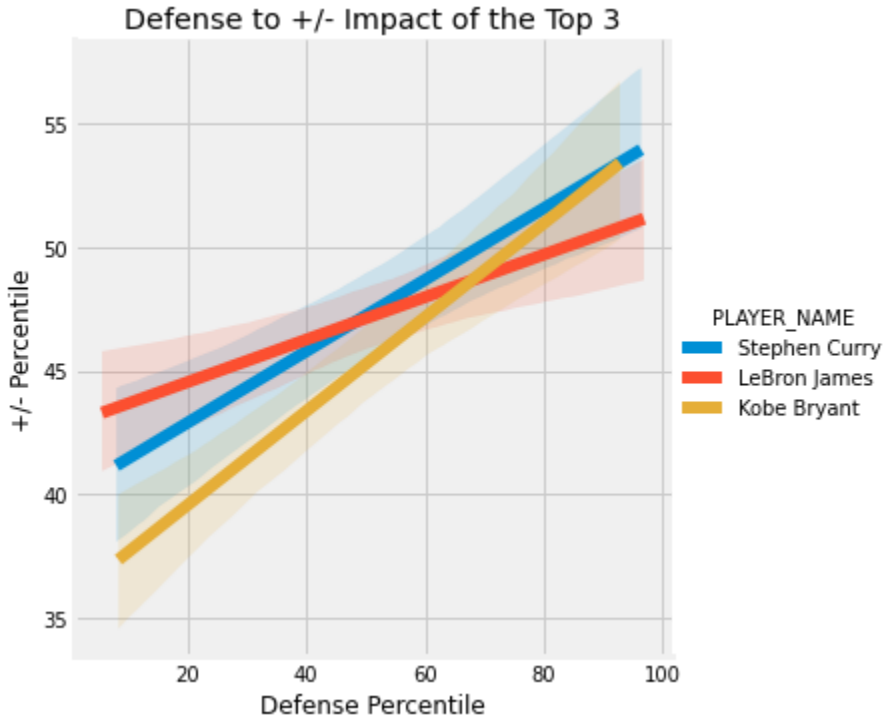
Defensive Rebounds



Defensive rebounds are the most common way for defensive teams to gain possession of the ball back. The ability to limit the offense of their shots is a great defensive ability.

The graph makes it easy to understand that Lebron is the best at defensive rebounds. As well as having the highest average defensive rebounds, Lebron also grows in his defensive rebounds the most as he plays more minutes. Therefore, Lebron gets one point. The current score is Curry - 2 Kobe - 1 Lebron - 7

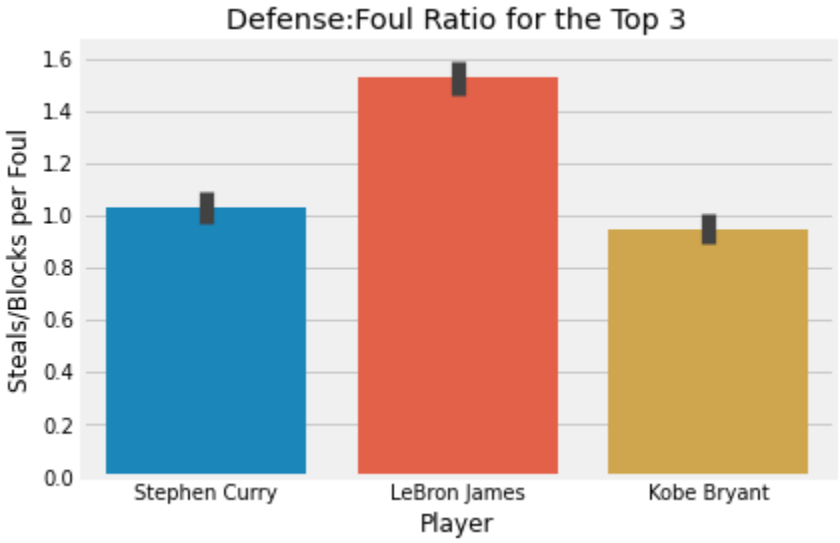
Defensive Impact to Plus Minus Impact



In this graph, ‘Defense Percentile’ refers to the percentile of steals and blocks a player has in a game relative to his average steals and blocks. A ‘+/-’ refers to a player's impact on the box score, and the ‘+/- percentile’ is the player’s percentile of their ‘+/-’. The point of this graph is to visualize how much a player's defense has an effect on the box score.

The graph illustrates that Lebron’s defensive impact on the game has a lot less effect on the box score than both Curry and Kobe. As Lebron’s defensive percentile ranges from lowest to highest, his +/- percentile barely changes compared to the other two. Therefore, Curry and Kobe get a point each. The current score is Curry - 3 Kobe - 2 Lebron - 7

Steals and Blocks per Foul



A defensive to foul ratio is effectively the same thing as the amount of total steals and blocks a player gets per one foul. It is clearly shown through the bar chart that Lebron triumphs Curry and Kobe when it comes to this statistic. Therefore, Lebron gains a point. The current score is Curry - 3 Kobe - 2 Lebron - 8

Conclusion

The Winner

Based on the final score of this analysis, Curry got 3 total points, Kobe got 2 total points, and Lebron got an outstanding 8 points. Essentially, Lebron completely prevails Curry and Bryant when it comes to basketball skills both offensively and defensively, and is the best player of the 21st Century

Possible Improvements

Although the statistics and graphs used were sufficient, it would be better if there were more stats on the defensive end(these stats are harder to create, thus why there were less). Also, a dataset which includes data from 2000 to 2022 would answer the question better.