**Analysis of Team NBA Stats (2000 – 2019)**

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**Introduction/Background**

One of the most interesting things to look at when it comes to NBA basketball is the statistics. More specifically, how certain stats may or may not affect the performance of a given team. Advanced analysis of statistics is something that people have been looking at across all sports for a while. While it is a common thing to look at and reference, it is not always the easiest thing to visualize. “Player X had the highest PPG average in the league in season Y, leading him to the highest number of win shares by a player in 15 seasons with a 3-point percentage less than Z%” is a sentence that is completely meaningless unless you know exactly what all of those things mean.

For the purpose of this project, there are only a few statistics to be aware of. Win/Loss, total points, 2-point percentage, 3-point percentage, field goal percentage, and free throw percentage. Win/loss and total points are pretty self-explanatory. On a basketball court, the outer arc is referred to as the “3-point line.” Any made shot within the arc counts as 2 points and any behind it count as 3 points. 2-point and 3-point percentage just refers to the percentage of made shots out of the ones attempted. Field goal percentage refers to the total percentage of shots made (2 and 3 point). A free throw is a shot after a foul occurs that only counts for 1 point. It is a shot taken without moving and without any defense, so most players tend to have a higher free throw percentage.

**Audience/Purpose of work**

The ideal audience for this work would be someone who is interested in NBA basketball or just likes looking at statistics as a whole. The purpose is to throw together some simple stats and be able to compare two teams side by side. This will allow people to draw their own conclusions as to what stats they believe have the biggest impact. Instead of just saying “the best teams in the league tend to be better at X,” people can look at this visualization and determine what they think is the most important stat. It will also be useful for showing how the best teams of each year compare side by side. This will make more sense after looking at the mockups for the visualization (below).

**Dataset(s)**

Every stat needed can be found on basketball-reference, here: <https://www.basketball-reference.com/leagues/NBA_2019.html>. That link is just the 2018-2019 season summary, but the website has that for each of the seasons needed for this visualization (2000-2019). The 2020 season is still not complete (postponed because of the virus season). Also, there was a “lockout” which delayed the start of the 2011-2012 season, so it was shortened to 50 regular season games instead of the normal 82. This should really only affect the total points statistic, since the rest of the stats are percentage based. Below is an example of how the table will be laid out:

Column Descriptions

|  |  |
| --- | --- |
| **Column Name** | **Description** |
| Team | Team Name (ex. Charlotte Hornets) |
| Season | Years that season spans, starts in the fall and ends in the spring so it spans 2 years (ex. 2000-2001, 2001-2002, etc.) |
| Total Points | The total amount of points that the team scored throughout the whole season |
| Win Percentage | The ratio of wins over total games played |
| 2 Point Percentage | Percentage of 2-point shots made |
| 3 Point Percentage | Percentage of 3-point shots made |
| Field Goal Percentage | Percentage of total shots made |
| Free Throw Percentage | Percentage of free throws made |

Example Table

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Team** | **Season** | **Total Pts.** | **Win %** | **2pt%** | **3pt%** | **FG%** | **FT%** |
| Toronto Raptors | 2018-2019 | 9384 | 0.707 | 55.7% | 38.5% | 49.1% | 80.1% |
| Golden State Warriors | 2018-2019 | 9650 | 0.695 | 53.9% | 36.6% | 47.4% | 80.4% |

Obviously this is only 2 rows, and there are 30 teams and 19 seasons, so it will be a bit larger than that (probably around 570 rows total). All of these stats can be found on the link above. A little bit of navigation is needed to get to the rest of the seasons, but it is all there.

**Visualization Method Proposal**

Below is a rough mockup of what the final visualization will look like. Obviously the final product will be a bit more colorful and exciting. The dropdown boxes at the bottom allow someone to pick which team and which seasons they want to look at. For example, they can view a team from the 2002-2003 season and compare that with one from the 2012-2013 season. The percentages are also placed in their relevant places. The 3-point percentage is displayed outside of the 3-point arc, the 2-point percentage is displayed inside the 3-point arc, and the free throw percentage is displayed behind the free throw line. Other miscellaneous stats are displayed above the court, such as total points, win percentage, and field goal percentage. I went with a hand drawing to start because I always like to hand draw something before trying to create it, especially when it is something visual. A close up of text on a white background

Description automatically generated

**Mechanics of Proposed Work**

*Plan A*

My first plan is probably the best way to go about doing something like this. I plan on using the JavaScript D3 library to create the majority of the visualization. It will all be displayed on a webpage, so there will be some HTML elements involved as well. The table itself will be saved in a .csv format so that it is easy to parse through. This will make it easy to grab the percentages and display them on court. In the final product, I may also display league averages for each of the stats off to the sides for the selected seasons as another way to compare. I already have a rough idea of how to begin this because I did something similar for one of my internships a few years ago. To turn it in, I will try hosting it on GitHub pages. This is not a final decision because I have never played around with GitHub pages before, so I am not sure how feasible this is.

*Plan B*

Plan B is something that I am not too comfortable with, so hopefully it doesn’t come to this. I would create almost the same visualization on Tableau rather than through JS/HTML.I am much more comfortable with JavaScript than I am with Tableau. I found a link (<https://kb.tableau.com/articles/howto/building-a-view-based-on-a-custom-background-map-and-custom-shapes>) which gives a guideline for getting started with something like this. This link shows how to add a basketball court to Tableau and begin to add interactions with it. Once I finish the visualization, I would post it on Tableau public for everyone to look at.

**Works Cited**

No sources needed.