MAT 243 Project One Summary Report

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In this project, I was responsible for comparing the skills and scoring performace of two different basketball teams from different time periods in the NBA. Using statistical analysis, we wanted to compare and understand the performance of the two teams. All data used in this study has been obtained from NBA game data, and we primarily focus on the two-time ranges for each team. To complete this analysis and properly compare the performance of both teams, I will be using descriptive statics, data visualizations, and confidence intervals.

	Name of Team	Assigned Years
1. Yours	Warriors	2013-2015
2. Assigned	Chicago Bulls	1996-1998

As the graph shows, I decided to go with the Warriors and my assigned years range from 2013 to 2015. My assigned team was the Chicago Bulls and the assigned years for that are from 1996 to 1998.

Graphs and data visualization are very important to understand data and I believe to properly understand the difference between the teams; the best graph is the histogram. I believe this graph will best show the point distribution scored by the Warriors. Below the graph clearly shows the frequency of different scoring ranges and provides great input on the team's consistent performance. The reason why I chose this graph is because it effectively shows how often the team scored within a certain time. Visually speaking, the graph shows a bell-shaped meaning it's a normal distribution. Thus, this means that the Warriors usually scored around the usual average with a few extremes here and there.

Histogram of points scored by Your Team in 2013 to 2015
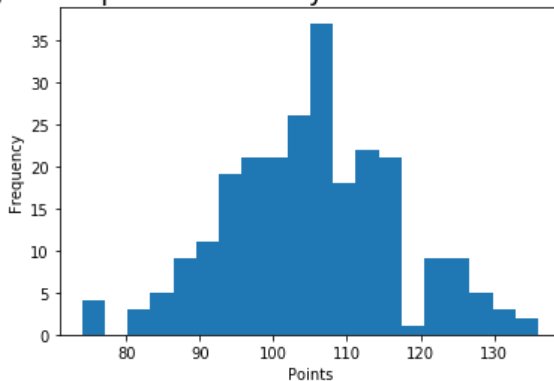
For the Chicago bulls with the time ranging from 1996 to 1998, I chose to do the histogram as well because like the previous one, I believe it's the best one for point distribution. I decided to go with histogram because it will easily help with comparing the Warriors plot and a clear consistency or variability in scoring. Looking at the graph we can also conclude that Bull's distribution was also approximately normal, which shows that they have a good range of performance with occasional deviations in their performance.

Histogram of points scored by the Bulls in 1996 to 1998
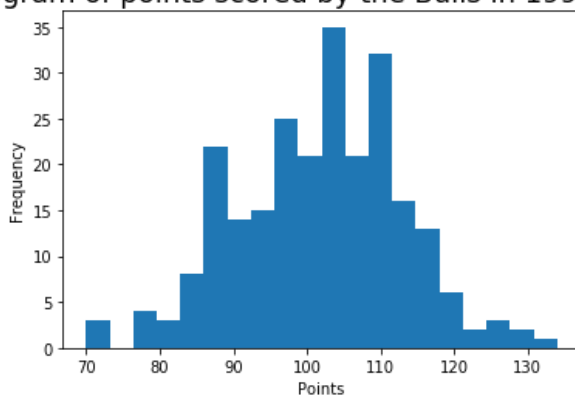
To compare the two teams the best, I've used the side-by-side boxplot. This was the most effective way to show the difference in median scores, spread, and potential outlines between the two teams. The boxplot was easy to see the central tendency and variability across both the groups in a signal visual. The reason I didn't chose histogram to compare points distribution was because of the overlap. At first glance it's nice but the more you compare it, you can notice lots

of flaws and make it messy. After reviewing the graph below, we can see that the Warriors have a slightly higher median score, and tighter distribution compared to the Bulls. This accounting to the graph shows more consistent high-scoring games.

Boxplot to compare points distribution
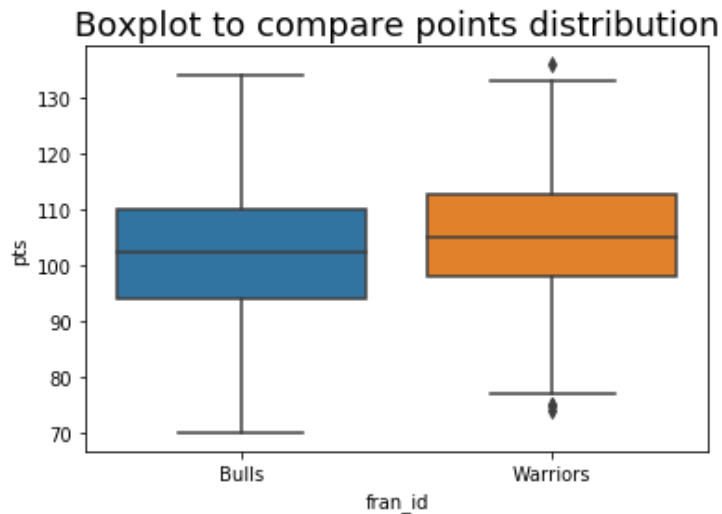
Statistic	Value
Mean	110.10
Median	109.0
Variance	124.45
Standard Deviation	11.11

The mean of 110.10 and the median of 109.0 show that we have a slightly right-skewed distribution but based on how close these values are we can also conclude that we have a generally symmetrical distribution. Since the distribution represents a bell-shaped distribution, the mean is a reasonable center. The standard deviation for 11.11 suggests that we have relatively consistent scoring.

Statistic	Value
Mean	103.63
Median	104.0

Variance	130.77
Standard Deviation	11.44

Looking at the data we can see that the mean and median are very close, which indicates that we have a roughly symmetric distribution. The slight increase in standard deviation compared to home games shows that the team generally scored higher and more consistently at home games than away games. The mean is used as the central tendency because it is almost equal to the median. Increased unpredictability away from home might indicate difficulties traveling or performing in new locations.

Confidence Level (%)	Confidence Interval
95%	(1502.02, 1507.18)

The range that we estimate the actual population's mean to fall inside is provided by confidence intervals. We can be 95% certain that the genuine average relative skill of all teams from 2013 to 2015 falls between 1502.02 and 1507.18 based on the interval provided. The interval would be larger if a different confidence level—such as 99%—were applied. The Warriors were one of the best teams at the time, as evidenced by the high likelihood that a team chosen at random would be less skilled than the Warriors.

Confidence Level (%)	Confidence Interval
95%	(1487.66, 1493.65)

From 1996 to 1998, overall comparable skill of all teams fell between 1487.66 and 1493.65, according to this interval. The scope of the interval would have changed if we had chosen a different confidence level. The time frame is shorter and doesn't overlap with the Warriors', suggesting that teams' average skill levels were typically lower during the Bulls' time. Either reduced competitive parity or more dominance by elite teams might result from this.

Looking through the data, we have learned a lot. Through the analysis we can see that the Warriors from 2013 to 2015 had consistently scored more points and had higher average skills compared to the Bull's from 1996 to 1998. Through the use of descriptive statistics and visualization we saw that the Warriors had a better and stronger performance at home than they did away from home. While it wasn't a big drop, they definably performed better at home. We were also able to find out that the Warriors played in a more competitive environment with higher skill levels through confidence intervals. These results are vital for comprehending how league competition, team dynamics, and performance consistency evolve over time. Such data may be used by teams and analysts to track their success or guide plans for sport and team development.