

MAT 243 Project One Summary Report

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1. Introduction: Problem Statement

The goal of this statistical research is to analyze the performance pattern of the Rockets basketball team by comparing its performance between 2013 and 2015 to the Bulls performance between 1996 and 1998 using a large set of available historical data. The statistical methods of data visualization, descriptive statistics, and confidence intervals will be utilized in this analysis.

2. Introduction: Your Team and the Assigned Team

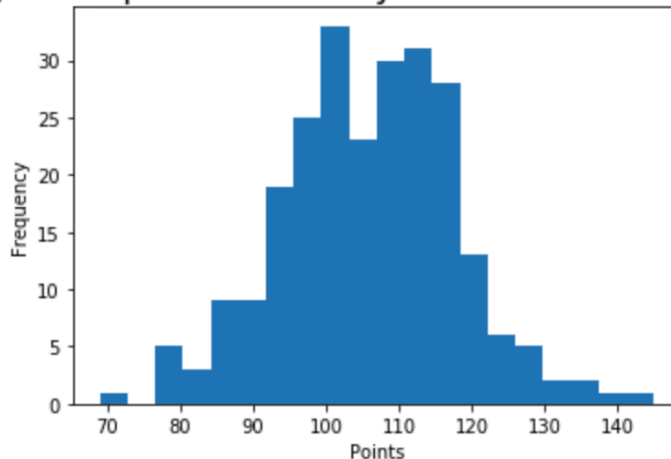
Table 1. Information on the Teams

	Name of Team	Assigned Years
1. Yours	The Rockets	2013 - 2015
2. Assigned	The Bulls	1996-1998

3. Data Visualization: Points Scored by Your Team

Data visualization is generally good at providing a visual description of trends that exists in a data set. This analysis will make use of the histogram because the research focuses mostly on a variable (points scored or skill level). Tracking the frequency of distribution of points scored over the years can yield meaningful insight on the team's performance. The histogram showed that the Rockets scored mostly between 100 and 120 points. With lowest point of about 70 and highest point of about 140.

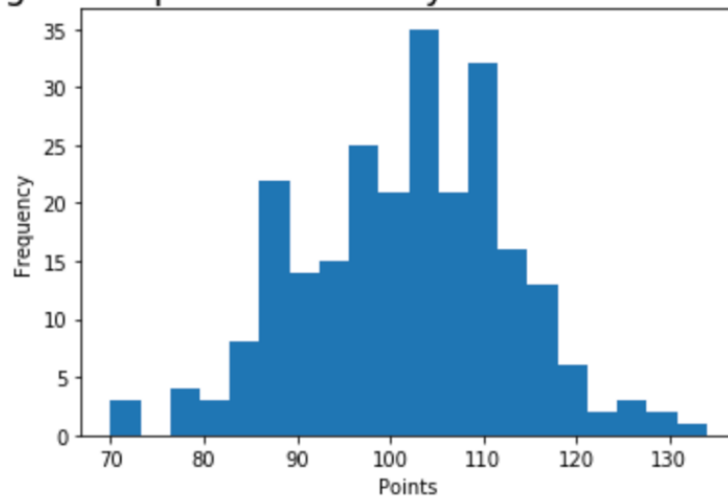
Histogram of points scored by Your Team in 2013 to 2015



4. Data Visualization: Points Scored by the Assigned Team

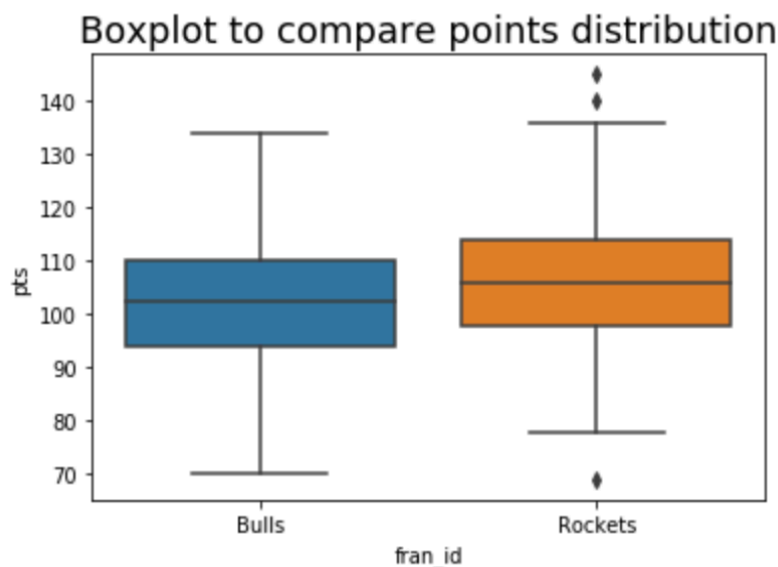
To adequately compare the point distribution of the assigned team using data visualization, it'll be beneficial to also use a histogram to visualize the performance of the assigned team as well. The point distribution for the Bulls shows that it struggled to maintain any point above the average point of about 105.

Histogram of points scored by the Bulls in 1996 to 1998



5. Data Visualization: Comparing the Two Teams

Data visualization can yield meaningful insight when comparing two different data distributions. Comparing the shape of the chart and how the distributions differ can help to make a quick generalized conclusion on how two data set differ. Although looking at the histograms show distribution differences, but the box plot immediately hints at which team performed better. The box plot shows that the Rockets might have performed better than the Bulls. The Rockets has a higher minimum, median, and maximum values. As well as higher 25% and 75% percentile values. It also shows that the infrequent low of 70 and high of 140 are outliers or uncommon occurrences.



6. Descriptive Statistics: Relative Skill of Your Team

Table 2. Descriptive Statistics for Relative Skill of Your Team

Statistic Name	Value
Mean	1596.29
Median	1602.14
Variance	1663.70
Standard Deviation	40.79

The central tendency and variability can be used to measure the average value of a data set and how different the low and high values are from the average. The Mean and Median of 1596.29 and 1602.14 respectively indicate the average skill level earned by the Rockets between 2013 and 2015. The variance and standard deviation describe how varied or spread the skill levels earned are. That the Mean is slightly lesser than Medium indicates a slight skew to the left.

7. Descriptive Statistics: Relative Skill of the Assigned Team

Table 3. Descriptive Statistics for Relative Skill of the Assigned Team

Statistic Name	Value
Mean	1739.80
Median	1751.23
Variance	2651.55
Standard deviation	51.49

The Mean and Median indicate the average skill level earned by the Bulls between 1996 and 1998. The Variance and Standard deviation describe how varied or spread the skill levels earned are. The measure of center also showed a slight skew to the left since the Median is greater than the Mean. Comparing these two measures of center indicates that the Bulls earned a higher average relative skill between 1996 and 1998 than the Rockets earned between 2013 and 2015.

8. Confidence Intervals for the Average Relative Skill of All Teams in Your Team's Years

Table 4. Confidence Interval for Average Relative Skill of Teams in Your Team's Years

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

The confidence interval is used to describe level of accuracy of an estimated parameter. Given a population mean of around 1504.60 and an error margin of ± 2.58 , the confidence interval indicates that there is a 95% confidence that the true average relative skill of all teams between 2013 and 2015 is between 1502.02 and 1507.18. Increasing the confidence level, to like 99%, can be used to calculate a confidence interval with a higher error margin. The probability that a team has an average relative skill level less than that of the Rockets (1596.29) between 2013 and 2015 is 0.7914, which is not unusual—since a 95% confidence interval indicates that the true average relative skill for all team is between 1502.0 and 1507.18 which is lesser than 1596.29.

9. Confidence Intervals for the Average Relative Skill of All Teams in the Assigned Team's Years

Table 5. Confidence Interval for Average Relative Skill of Teams in Assigned Team's Years

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

Given a population mean of around 1490.655 and an error margin of about ± 3 , the confidence interval indicates that there is a 95% confidence that the true average relative skill of all teams between 1996 and 1998 is between 1487.66 and 1493.65. Decreasing the confidence level, to like 90%, can be used to calculate a confidence interval with a lower error margin. This confidence interval shows that the average relative skill for all teams increased between 2013 and 2015.

10. Conclusion

This analysis provides us with parameters from the Rockets performances in 1996-1998 and 2013-2015 as well as the average relative skill for all teams within those time periods to decide whether the Rocket had improved or not. With the Bull's average skill level of 1739.80 much larger than all teams' average relative skill of 1490.655 between 1996 and 1998, and the Rocket's average skill level of 1596.29 just around the average relative skill of all teams at 1504.60 between 2013 and 2015; one can conclude that the Rockets has not improved much in performance and may need to increase its relative skill level to improve.