# MAT 243 Project Two Summary Report

Nicholas Cleveland

nicholas.cleveland1@snhu.edu

Southern New Hampshire University

Note: Replace the bracketed text on page one (the cover page) with your personal information.

## Introduction: Problem Statement

*Discuss the statement of the problem in terms of the statistical analyses that are being performed. In your response, you should address the following questions:*

* *What is the problem you are going to solve?*
* *What data set are you using?*
* *What statistical methods will you be using to do the analysis for this project?*

*The problem that I am going to solve in this report is the analysis of basketball teams from the NBA in a statistical manner. By doing this, results will be uncovered and interpreted.*

## Introduction: Your Team and the Assigned Team

The team that I picked was the Cleveland Cavaliers, the same team that I chose for the last project, in order to keep consistency and discover more information about them. I was again given the years of 2013-2015.

The team that I was assigned for a comparative study was again the Chicago Bulls for the range of 1996 – 1998.

|  | **Name of Team** | **Years Picked** |
| --- | --- | --- |
| 1. Yours | Cleveland Cavaliers | 2013 – 2015 |
| 2. Assigned | Chicago Bulls | 1996- 1998 |

Table 1. Information on the Teams

## Hypothesis Test for the Population Mean (I)

*Suppose a relative skill level of 1342 represents a critically low skill level in the league. The management of your team has hypothesized that the average relative skill level of your team is greater than 1342. You tested this claim using a 5% level of significance. For this test, you assumed that the population standard deviation for relative skill level is unknown. Explain the steps you took to test this problem and interpret your results.*

*See Step 3 in the Python script to address the following items:*

* *In general, how is hypothesis testing used to test claims about a population mean?*

Hypothesis testing is used to test claims about a population mean in that it processes a claim, and then wages that claim against the alternative by using a proof and comparative statistical method. The proof is that if we have a null hypothesis, we must have an alternative to it. It cannot be both. The proof usually sets the null hypothesis as the opposite of what the researcher wants, and the alternative hypothesis being what they do want. This is generally measured in one of three different ways. The first is having a null hypothesis of where the specimen being tested is null and the alternative being not null. This is described as H0 = 0 and Ha /= 0. One important factor here is that when we analyze this with a test for a p-value, the p-value must be a **two-tailed** p-value.

Hypotheses can also describe the specimen as being greater than the alternative or less than the alternative. These are the other two ways.

These are generally described as H0 = 0 and Ha >0, H0 = 0 and Ha < 0.

One important factor here is that when we analyze this with a test for a p-value, the p-value must be a **one-tailed** p-value.

* *Summarize all important steps of the hypothesis test. This includes:*
  1. *Null Hypothesis (statistical notation and its description in words)*

*The null hypothesis in this case is*

* 1. *Alternative Hypothesis (statistical notation and its description in words)*

*The alternative hypothesis in this case is*

* 1. *Level of Significance*

*The level of significance is*

| **Statistic** | **Value** |
| --- | --- |
| Test Statistic | X.XX  *\*Round off to 2 decimal places.* |
| P-value | X.XXXX  *\*Round off to 4 decimal places.* |

Table 2: Hypothesis Test for the Population Mean (I)

* 1. *Conclusion of the hypothesis test and its interpretation based on the P-value*
* *What are the implications of your findings from this hypothesis test? What is its practical significance?*

## Hypothesis Test for the Population Mean (II)

*Your team’s coach has hypothesized that average number of points scored by your team in the team’s years is less than 110 points. For this test, you assumed that the population standard deviation for points scored is unknown. You tested the claim using a 1% level of significance. Explain the steps you took to test this problem and interpret your results.*

*See Step 4 in the Python script to address the following items:*

* *Summarize all important steps of the hypothesis test. This includes:*
  1. *Null Hypothesis (statistical notation and its description in words)*
  2. *Alternative Hypothesis (statistical notation and its description in words)*
  3. *Level of Significance*
  4. *Report the Test Statistic and the P-value in a formatted table as shown below:*

Table 3: Hypothesis Test for the Population Mean (II)

| **Statistic** | **Value** |
| --- | --- |
| Test Statistic | X.XX  *\*Round off to 2 decimal places.* |
| P-value | X.XXXX  *\*Round off to 4 decimal places.* |

* 1. *Conclusion of the hypothesis test and its interpretation based on the P-value*
* *What are the implications of your findings from this hypothesis test? What is its practical significance?*

## Hypothesis Test for the Population Proportion

*Suppose the management claims that the proportion of games that your team wins when scoring 80 or more points is 0.50. You tested this claim using a 5% level of significance. Explain the steps you took to test this problem and interpret your results.*

*See Step 5 in the Python script to address the following items:*

* *In general, how is hypothesis testing used to test claims about a population proportion?*
* *Summarize all important steps of the hypothesis test. This includes:*
  1. *Null Hypothesis (statistical notation and its description in words)*
  2. *Alternative Hypothesis (statistical notation and its description in words)*
  3. *Level of Significance*
  4. *Report the Test Statistic and the P-value in a formatted table as shown below:*

Table 4: Hypothesis Test for the Population Proportion

| **Statistic** | **Value** |
| --- | --- |
| Test Statistic | X.XX  *\*Round off to 2 decimal places.* |
| P-value | X.XXXX  *\*Round off to 4 decimal places.* |

* 1. *Conclusion of the hypothesis test and its interpretation based on the P-value*
* *What are the implications of your findings from this hypothesis test? What is its practical significance?*

## Hypothesis Test for the Difference Between Two Population Means

*You were asked to compare your team’s skill level (from its years) with the assigned team’s skill level (from the assigned time frame). You tested the claim that the skill level of your team is the same as the skill level of the assigned team, using a 1% level of significance.*

*See Step 6 in the Python script to address the following items:*

* *In general, how is hypothesis testing used to test claims about the difference between two population means?*
* *Summarize all important steps of the hypothesis test. This includes:*
  1. *Null Hypothesis (statistical notation and its description in words)*
  2. *Alternative Hypothesis (statistical notation and its description in words)*
  3. *Level of Significance*
  4. *Report the Test Statistic and the P-value in a formatted table as shown below:*

Table 5: Hypothesis Test for the Difference Between Two Population Means

| **Statistic** | **Value** |
| --- | --- |
| Test Statistic | X.XX  *\*Round off to 2 decimal places.* |
| P-value | X.XXXX  *\*Round off to 4 decimal places.* |

* 1. *Conclusion of the hypothesis test and its interpretation based on the P-value*
* *What are the implications of your findings from this hypothesis test? What is its practical significance?*

## Conclusion

*Describe the results of your statistical analyses clearly, using proper descriptions of statistical terms and concepts.*

* *What is the practical importance of the analyses that were performed?*
* *Describe what these results mean for the scenario.*

* Answer the questions in a paragraph response. Remove all questions and this note before submitting! Do not include Python code in your report.*

## Citations

*You were* ***not*** *required to use external resources for this report. If you did not use any resources, you should remove this entire section. However, if you did use any resources to help you with your interpretation, you* ***must*** *cite them. Use proper APA format for citations.*

Insert references here in the following format:

Author's Last Name, First Initial. Middle Initial. (Year of Publication). Title of book: Subtitle of book, edition. Place of Publication: Publisher.