MATH221 Statistics for Decision Making

Week 6 Lab

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Statistical Concepts:

* Confidence Intervals
* Data Simulation
* Normal Probabilities

Short Answer Writing Assignment

All answers should be complete sentences.

In the Week 2 Lab, you found the mean and the standard deviation for the SLEEP variable for both males and females. Use those values for follow these directions to calculate the numbers again.

(From Week 2 Lab: Calculate descriptive statistics for the variable Sleep by Gender. Sort the data by gender by clicking on Data and then Sort. Copy the Sleep of the males from the data file into the Descriptive Statistics worksheet of the Week 1 Excel file. [Write down the mean and standard deviation.] These are sample data. Then, copy and paste the female data into the Descriptive Statistics workbook and do the same. Keep three decimal places.)

You will also need the number of males and the number of females in the dataset. You can actually count these in the dataset.

Then use the Week 5 spreadsheet to calculate the following confidence intervals. The male confidence interval would be one calculation in the spreadsheet and the females would be a second calculation.

1. Give and interpret the 95% confidence intervals for males and a second 95% confidence interval for females on the SLEEP variable. Which is wider and why?

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1. Give and interpret the 99% confidence intervals for males and a second 99% confidence interval for females on the SLEEP variable. Which is wider and why?

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We need to find the confidence interval for the SHOE SIZE variable. To do this, we need to find the mean and standard deviation with the Week 1 spreadsheet. Then we can the Week 5 spreadsheet to find the confidence interval. This does not need to be separated by males and females, rather one interval for the entire data set.

First, find the mean and standard deviation by copying the SHOE SIZE variable and pasting it into the Week 1 spreadsheet. Write down the mean and the sample standard deviation as well as the count. Open the Week 5 spreadsheet and type in the values needed in the green cells at the top to find the confidence interval.

1. Give and interpret the 95% confidence interval for the size of students’ shoes.

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Change the confidence level to 99% to find the 99% confidence interval for the SHOE SIZE variable.

1. Give and interpret the 99% confidence interval for the size of students’ shoes.

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1. Compare the 95% and 99% confidence intervals for the size of students’ shoes. Explain the difference between these intervals and why this difference occurs.

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1. Find the mean and standard deviation of the DRIVE variable by copying that variable into the Week 1 spreadsheet. Use the Week 4 spreadsheet to determine the percentage of data points from that data set that we would expect to be less than 25. To find the actual percentage in the dataset, sort the DRIVE variable and count how many of the data points are less than 25 out of the total 35 data points. That is the actual percentage. How does this compare with your prediction?

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| Mean: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Standard deviation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Predicted percentage:  Actual percentage:  Comparison \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

1. What percentage of data would you predict would be between 25 and 50 and what percentage would you predict would be more than 50 miles? Use the Week 4 spreadsheet again to find the percentage of the data set we expect to have values between 25 and 50 as well as for more than 50. Now determine the percentage of data points in the dataset that fall within each of these ranges, using same strategy as above for counting data points in the data set. How do each of these compare with your prediction and why is there a difference?

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| Predicted percentage between 25 and 50: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Actual percentage:  Predicted percentage more than 50 miles:  Actual percentage: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Comparison \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |