Statistics – Lab #6

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

Statistical Concepts:

* Data Simulation
* Discrete Probability Distribution
* Confidence Intervals

# Calculations for a set of variables

* Open the class survey results that were entered into the MINITAB worksheet.
* We want to calculate the mean for the 10 rolls of the die for each student in the class. Label the column next to die10 in the Worksheet with the word **mean**. Pull up **Calc > Row Statistics** and select the radio-button corresponding to **Mean**. For **Input variables:** enter all 10 rows of the die data. Go to the **Store result in:** and select the **mean** column. Click **OK** and the mean for each observation will show up in the Worksheet.
* We also want to calculate the median for the 10 rolls of the die. Label the next column in the Worksheet with the word **median**. Repeat the above steps but select the radio-button that corresponds to **Median** and in the **Store results in:** text area, place the **median** column.

# Calculating Descriptive Statistics

* Calculate descriptive statistics for the mean and median columns that where created above. Pull up **Stat > Basic Statistics > Display Descriptive Statistics** and set **Variables:** to mean and median. The output will show up in your Session Window. Print this information.

# Calculating Confidence Intervals for one Variable

* Open the class survey results that were entered into the MINITAB worksheet.
* We are interested in calculating a 95% confidence interval for the hours of sleep a student gets. Pull up **Stat > Basic Statistics > 1-Sample t** and set **Samples in columns:** to Sleep. Click the **OK** button and the results will appear in your Session Window.
* We are also interested in the same analysis with a 99% confidence interval. Use the same steps except select the **Options** button and change the **Confidence level:** to 99.

Short Answer Writing Assignment

All answers should be complete sentences.

1. When rolling a die, is this an example of a discrete or continuous random variable? Explain your reasoning.

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1. Calculate the mean and standard deviation of the probability distribution created by rolling a die. Either show work or explain how your answer was calculated.

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| Mean: \_\_\_\_\_\_\_\_\_\_\_\_ Standard deviation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

1. Give the mean for the mean column of the Worksheet. Is this estimate centered about the parameter of interest (the parameter of interest is the answer for the mean in question 2)?

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1. Give the mean for the median column of the Worksheet. Is this estimate centered about the parameter of interest (the parameter of interest is the answer for the mean in question 2)?

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1. Give the standard deviation for the mean and median column. Compare these and be sure to identify which has the least variability?

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1. Based on questions 3, 4, and 5 is the mean or median a better estimate for the parameter of interest? Explain your reasoning.

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1. Give and interpret the 95% confidence interval for the hours of sleep a student gets.

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1. Give and interpret the 99% confidence interval for the hours of sleep a student gets.

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1. Compare the 95% and 99% confidence intervals for the hours of sleep a student gets. Explain the difference between these intervals and why this difference occurs.

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