STAT 145 Practice for Part 2 of the Unit 1 Exam: Technology Required; One-sided cheat-sheet allowed; Calculator and technology allowed. If rounding is needed, please leave 3 decimal places. Delete the text boxes if they become annoying.

Part 2 of your final exam will be completed by typing into this document or placing answers onto a new document. You may use a calculator during the exam. You must have access to statistical technology (StatHelper, Minitab, TI Graphing Calculator) and are authorized to use a one-sided cheat sheet. Take a photo of your cheat sheet and insert the image at the end of this document before submitting.
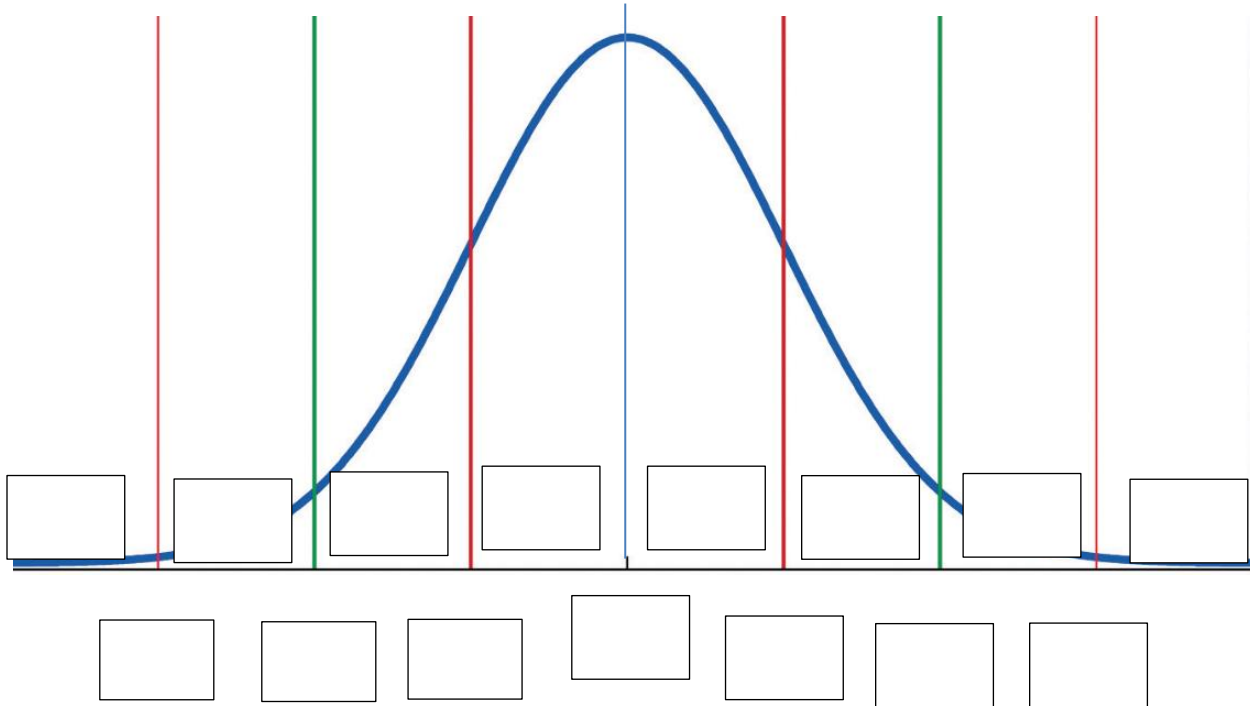
On my honor, as a Rochester Institute of Technology student, I have neither given nor received unauthorized assistance in taking this exam. I have not looked up methods or ideas during the course of the exam. Typing your name here acknowledges agreement with this statement.

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Problem #1

It was published that the weights of carrots grown under certain conditions are normally distributed with a mean of 60g and a standard deviation of 8g.

A. Draw a picture of the empirical rule for this data – **label the weights and percentages.**

Answer the following questions:

B. What percentage of carrots do you expect to weigh between 44g and 60g?

C. What weight of carrot represents the 16th percentile?

D. Interpret the 16th percentile in a complete sentence and in the context of the problem.

E. A recent harvest found numerous carrots to weigh 38g. Is this weight considered <u>unusual</u> for this sample? Explain.

F. What percentage of carrots do you expect to weigh less than 68g?

Problem #2
A random sample of patients in a medical clinic were studied. We are interested in determining if there is a linear relationship between height (inches) and lung capacity (liters). Specifically, can the height be used to predict the lung capacity? The data can be found in the <mark>4 Week 4 145 Exam Data.xlsx</mark> file and is labeled **Problem 2.**

    A. Indicate which variable is the response variable.

    B. Using technology, construct a scatterplot and paste the graph here.

    C. Using technology, report the correlation value for these data.

    D. Interpret the correlation value, in the context of the problem. Use a complete sentence. Be sure to indicate the strength and direction of the linear relationship.

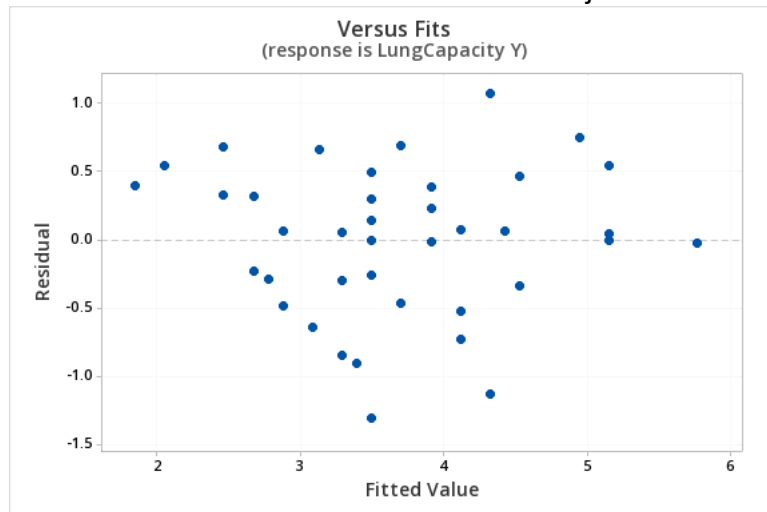   E. Provide the equation of the regression line for these data or paste the output.

    F. Interpret the slope of this line, in the context of the problem and in a complete sentence.

G. Using technology, report the coefficient of determination, R^2, for these data:

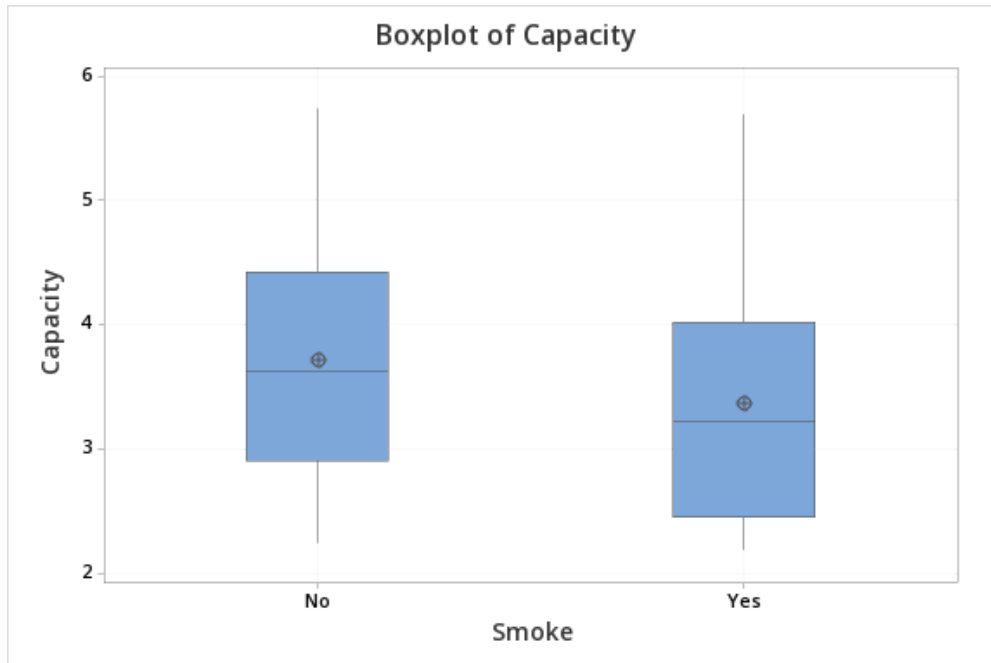H. Interpret the coefficient of determination in the context of the problem.

I. Calculate the residual for an individual with a height of 61 inches. Show your work.

J. A residual plot was produced using these data. Based on the plot, do you believe a linear model is a valid model for these data? Give some justification for your answer using the residual plot.

Versus Fits
(response is LungCapacity Y)

Problem #3
The same random sample of patients in a medical clinic were also asked whether they smoke (Yes or No) along with the previously studied lung capacity (liters). Comparative box plots were made with the lung capacity data separated by smoking status.

A. Based on the comparative box plots, do smokers or non-smokers have the higher lung capacity, on average? Explain how you know.

B. Based on the comparative box plots, your colleague states that the spread of the lung capacity data appears approximately the same for both smokers and non-smokers. Do you agree? Explain.

Problem #4

We will focus only on the non-smoker's lung capacity data. The data can be found in the <mark>4 Week 4 145 Exam Data.xlsx</mark> file and is labeled **Problem 4.**

    A. Using these data, calculate the following summary statistics and fill in the table:
        [Leave 3 decimal places]

Mean =	
Standard Deviation=	
Min	
Q1	
Median	
Q3	
Max	
IQR	

    B. Find the lower and upper outlier fences for the non-smoker lung capacity data [Show your work or paste the technology output]. **Interpret the lower and upper outlier fences in a complete sentence.**

    C. What would you report as typical lung capacity for this sample of non-smokers? Explain why you chose this value.

D. **Calculate and interpret** the Z-score for a patient with a lung capacity of 5 liters. [show your work].

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1. If your program of study requires it, would you be interested in taking Intro to Statistics II online, if it were offered? [Note, it is not currently offered online]

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2. Insert an image of your cheat sheet here: