

Lab 5 Assignment

MA 2611

*Successful completion and submission of this assignment in html, pdf, or docx format through the use of R Markdown will meet one of your two required assignments for the **L.1 standard**. The following problems are numbered based on the lab standard that is intended be met. Your grade will be based on whether these standards are met. Refer to the syllabus for further details on standards-based grading.*

Problem L.17 and L.18. Let a continuous random variable $X \sim Normal(62, 6.78)$. Generate the code and output for calculating the following:

- $P(52 \leq X \leq 56)$
- $P(X \geq 75)$
- 10th percentile of X
- 95th percentile of X

Problem L.19. Using the built-in "ChickWeight" data frame:

- Create a Normal Q-Q plot with a Q-Q line of the "weight" data which meets the following criteria.
 - Uses point and line colors which were not used in this or previous labs
 - Uses point shapes which were not used in this lab
 - Contains appropriate axis labels and a title
- Create a grouped Normal Q-Q plot with Q-Q lines of the "weight" data by "diet" type which meets the following criteria.
 - Uses different point and line colors for each group which were not used in this or previous labs
 - Uses different point shapes for each group which were not used in this lab
 - Contains appropriate axis labels and a title
- Compare the plots in **parts a and b**. What happens to the assumption of the "weight" data being normal when it is grouped by "diet" type?

Problem L.20. A snack food company uses a machine to package 454 oz bags of peanuts. As part an in-line inspection, to ensure the machine is calibrated properly, operators measured the weights (in oz) of $n = 25$ randomly selected bags. Assume the net weights of the bags are normally distributed.

456.1 454.9 463.4 454.4 439.9 439.4 433.6 454.4 441.2 451.7 451.1 454.1 449.7 450.1 449.6 449.8 448.2 451.5 447.9 449.2 455.1 454.5 459.2 453.7 456.5

Generate the code and output for a 95% confidence interval for the weight of the peanut bags. With 95% confidence, are the bags being packaged within the expected weight?

Problem L.21. In a randomly selected group of 568 students, when asked to pick a random number between 1 and 20, 42 students chose the number 7. There is curiosity if the students will be biased towards picking "lucky number" 7 or if the likelihood is the same for all 20 numbers.

Generate the code and output for a 99% confidence interval for the proportion of students in favor of the number seven. With 99% confidence, is there potential bias towards "lucky number" 7?