

Unit 3: Assignment

In this Assignment, you will be assessed based on the following outcome:

GB513-2: Apply hypothesis testing and probability analysis to solve business problems.

This Assignment has two parts. Part 1 has questions about probability calculations. Part 2 has questions about hypothesis testing. You will use Excel only in Question 6. All other questions should be calculated manually. Follow all instructions carefully.

Make sure to use the **Unit 3 Assignment template** located in the Course Documents module to submit your answers. Type in your calculations. Pictures of hand written work are not acceptable.

Part 1

Question 1

In a class where the exam averages are normally distributed, the mean score is 75 and the standard deviation is 10. If you want to find out the probability that a randomly picked student has scored 105 or above, what is the z-value that you should look up on the normal distribution table?

Question 2

According to a report by Scarborough Research, the average monthly household cellular phone bill is \$73. Suppose local monthly household cell phone bills are normally distributed with a standard deviation of \$11.

- a. What is the probability that a randomly selected monthly cell phone bill is less than \$95?
- b. What is the probability that a randomly selected monthly cell phone bill is between \$62 and \$84?

Question 3

A Travel Weekly International Air Transport Association survey asked business travelers about the purpose for their most recent business trip. 19% responded that it was for an internal company visit. Suppose 950 business travelers are randomly selected.

- a. What is the probability that more than 20% of the business travelers say that the reason for their most recent business trip was an internal company visit?
- b. What is the probability that between 18% and 20% of the business travelers say that the reason for their most recent business trip was an internal company visit?

Part 2**Question 4**

Suppose a study reports that the average price for a gallon of self-serve regular unleaded gasoline is \$3.16. You believe that the figure is higher in your area of the country. You decide to test this claim for your area of the United States by randomly calling gasoline stations. Your random survey of 25 stations produces the following prices (all in dollars). Assume gasoline prices for a region are normally distributed.

Did the data you obtained provide enough evidence to reject the claim? Use a 1% level of significance.

Make sure you clearly state both the null and the alternative hypotheses in full sentences. Following your calculations, clearly state the conclusion in the same manner (do not simply say “accept/reject null”) and explain how you arrived at this conclusion (based on which metrics).

3.27
3.3
3.16
3.15
3.11
3.05
3.54
3.25
3.05
3.11
3.13
3.15
3.27
3.14
3.14
3.2
3.3
3.09
3.05
3.07
3.37
3.34
3.35
3.35
3.1

Question 5

Where do CFOs get their money news? According to Robert Half International, 47% get their money news from newspapers, 15% get it from communication/colleagues, 12% get it from television, 11% from the Internet, 9% from magazines, 5% from radio, and 1% do not know. Suppose a researcher wants to test these results. She randomly samples 76 CFOs and finds that 40 of them get their money news from newspapers. Does the test show enough evidence to reject the findings of Robert Half International? Use $\alpha = .05$.

Make sure you clearly state both the null and the alternative hypotheses in full sentences. Following your calculations, clearly state the conclusion in the same manner (do not simply say “accept/reject null”) and explain how you arrived at this conclusion (based on which metrics).

Question 6

To answer this question, use the Data Analysis Toolpack in Excel and select “t-Test: Two-Sample Assuming Equal Variances” from the list of available tools. Conduct a hypothesis test using this tool. Explain your answer (how you decided if men spend more or not) and include the output table.

Some studies have shown that in the United States, men spend more than women buying gifts and cards on Valentine’s Day. Suppose a researcher wants to test this hypothesis by randomly sampling men and women with comparable demographic characteristics from various large cities across the United States to be in a study. Each study participant is asked to keep a log beginning 1 month before Valentine’s Day and record all purchases made for Valentine’s Day during that 1-month period. The resulting data are shown below. Use these data and a 1% level of significance to test to determine if, on average, men actually do spend significantly more than women on Valentine’s Day. Assume that such spending is normally distributed in the population and that the population variances are equal.

Make sure you clearly state both the null and the alternative hypotheses in full sentences. Include the output table; then, clearly state the conclusion in the same manner (do not simply say “accept/reject null”) and explain how you arrived at this conclusion (based on which metrics).

Men	Women
107.48	125.98
143.61	59.32
90.19	96.35
125.53	80.62
70.79	77.6
83	84.34
129.63	75.21
154.22	68.48

93.8	65.84
111.25	126.11
78.6	82.54
89.35	123.5

Directions for submitting your Assignment

Make sure to use the **Unit 3 Assignment template** from Course Resources when you turn in your answers. Submit your Assignment to the Dropbox.

Unit 3 Assignment		
Criteria	Points Possible	Points Earned
Question 1 The z-score for $P(x > 105)$.	5	
Question 2a Probability that a randomly selected monthly cell phone bill is less than \$95.	10	
Question 2b Probability that a randomly selected monthly cell phone bill is between \$62 and \$84.	10	
Question 3a Probability that more than 20% of the business travelers say that the reason for their most recent business trip was an internal company visit.	10	
Question 3b Probability that between 18% and 20% of the business travelers say that the reason for their most recent business trip was an internal company visit.	10	
Question 4 Correct null and alternative hypotheses in full sentences.	7	

Question 4 Correct work, explanation, and conclusion in full sentences.	8	
Question 5 Correct null and alternative hypotheses in full sentences.	7	
Question 5 Correct work, explanation, and conclusion in full sentences.	8	
Question 6 Correct null and alternative hypotheses in full sentences.	7	
Question 6 Correct Excel table, explanation, and conclusion in full sentences.	8	
Properly completed Assignment template.	10	
Total	100	