Name:

SM339 · Applied Statistics   Spring 2024 · Uhan

Quiz 2 – 1/25/2024

Instructions. You have 15 minutes to complete this quiz. You may use your plebe-issue TI-36X Pro calculator. You may <u>not</u> use any other materials.

<u>Show all your work.</u> To receive full credit, your solutions must be completely correct, sufficiently justified, and easy to follow.

Problem	Weight	Score
1a	1	
1b	1	
2a	0.5	
2b	0.5	
2c	0.5	
2d	0.5	
Total		/ 40

Problem 1. You have been recently hired as an analyst at the Simplexville Auto Emporium. You are interested in the mean price for a used 5-year-old SUVs. You randomly sample 27 such listings on Cars.com. Using a normal Q-Q plot, you find that your price data approximately follows a Normal distribution. You also find that the sample mean price is $28,141, and the sample standard deviation is $5,776.

a. Construct a 95% confidence interval for the mean price for a used 5-year old sedan. Provide your answers to 3 decimal places.

You may find the following critical values helpful: $t_{0.005,26} = 2.77$ $t_{0.025,26} = 2.05$ $t_{0.05,26} = 1.70$

b. You explain to your new colleague that you are "95% confident" that the interval you found in part a contains the true mean nightly rate. Briefly explain what this means.

Problem 2. The Simplexville Theater has recently hired you as an analyst. In the past, the theater sold an average of 725 tickets per day. You've been asked to test whether the average daily number of tickets sold has <u>dropped</u> significantly over the past year.

Using the records for the past year, based on 260 operating days, the sample mean of the daily number of tickets sold is 712, and the sample standard deviation is 118.

Perform a t-test for one population mean by answering the following prompts.

a. Let μ be the mean daily number of tickets sold. State the null and alternative hypotheses.

b. Calculate the test statistic. Provide your answer to three decimal places.

c. Suppose the p-value is 0.038. Using a significance level of 0.05, do you reject or fail to reject the null hypothesis? Briefly explain.

d. Based on your answer to part c, state your conclusion about the average daily number of tickets sold.