

Lab Assignment #20

This lab is due at 9:35 AM on Wednesday, 4/17 and is worth 6 points. This may be done individually, or in a group of 2 or 3 people.

1) Which candy tastes better: Ghirardelli or Palmer? Fifteen statistics students are asked to rate a number of candy samples on a scale of 1 to 10, 10 being "the candy of my dreams" and 1 being "I hope I never do that again." Do the data show that on average either candy receives a higher average score for all stats students?

Use $\alpha = 10\%$.

Student	Palmer score	Ghirardelli score
1	8	5
2	6	5
3	7	9
4	7	9
5	7	4
6	4	2
7	6	6
8	8	9
9	8	4
10	9	7
11	10	6
12	10	9
13	6	3
14	8	7
15	6	9

Note: the wording in this problem is very tricky, but it does give a two-tailed alternative. Why?

- Write the null and alternative hypotheses. Make sure to define μ_d .
- Calculate the test statistic. (It's t .)
- Find bounds on the tail area, and thus, on the p -value. (The p -value equals twice the tail area for this problem.)
- State your conclusion.
- Write a 1-sentence summary.
- Check your answer t and p on your GC, if you have a GC.

2) Find a 90% confidence interval for the average difference in rating between Palmer and Ghirardelli for all stats students. Write a 1-sentence summary.

3) Two different brands of gasoline are tested to see if the brands cause cars to have the same gas mileage. A random sample of 13 cars is chosen. Each car starts with an empty gas tank, then is filled with 5 gallons of one brand of fuel. Then the car is driven until the tank is empty, and the number of miles driven is recorded. This is repeated for the other brand of gasoline. Test the claim at $\alpha = 1\%$ that brand B of gasoline gives better (higher) gas mileage than brand A in all cars.

Data:

Average miles from gas brand A: 136.9 miles

Average miles from gas brand B: 141.1 miles

Standard deviation of differences: 9.2 miles

Sample size: 13

- a) Write the null and alternative hypotheses. Make sure to define μ_d .
- b) Calculate the test statistic. (It's t .)
- c) Find bounds on the tail area, and thus, on the p -value. (The p -value equals the tail area for this problem.)
- d) State your conclusion.
- e) Write a 1-sentence summary.
- f) Check your answer t and p on your GC, if you have a GC.

4) Find a 98% confidence interval for the average difference in miles between brand B and brand A for all cars. Write a 1-sentence summary.