L13 HW

- Due Feb 26 at 11:59pm
- Points 17
- Questions 17
- Time Limit None
- Allowed Attempts 3

Instructions

You get two attempts on all homework quizzes.

In all quizzes and homeworks in this course, round your answers to THREE DECIMAL places unless otherwise indicated.

Take the Quiz Again

Attempt History

	Attempt	Time	Score
KEPT	Attempt 2	7 minutes	17 out of 17
LATEST	Attempt 2	7 minutes	17 out of 17
	Attempt 1	39 minutes	13 out of 17

ⓘ Answers will be shown after your last attempt

Score for this attempt: 17 out of 17
Submitted Feb 25 at 1:27pm
This attempt took 7 minutes.

Use the following information to answer all the parts of this question.

The compressive strength, in kilopascals, was measured for concrete blocks from 8 different batches of concrete, both three and six days after pouring. The data is found in the file:
CompressiveStrength.xlsx (https://byui.instructure.com/courses/398828/files/159316666/download?wrap=1) ↓ (https://byui.instructure.com/courses/398828/files/159316666/download?download_frd=1)

We are interested in checking if the mean strength after six days is greater than the mean strength after three days.

Question 1

1 / 1 pts

Part 1: Which hypothesis test would be most appropriate for this study?

- One sample t-test
- Paired-samples t-test
- Independent samples t-test

Question 2

1 / 1 pts

Part 2: Is the alternative hypothesis for this test one-tailed or two-tailed?

- One-tailed
- Two-tailed

Question 3

1 / 1 pts

Part 3: What is the P-value for this test?

0

Question 4

1 / 1 pts

Part 4: Based on the results of the test, can you say that there is evidence to show that the mean after six days is significantly higher than the 3-day? Use a level of significance of 0.05.

- Yes, because the P-value was greater than the level of significance.
- Yes, because the P-value was lower than the level of significance.
- No, because the P-value was greater than the level of significance.
- No, because the P-value was lower than the level of significance.

Open the file **Failure pressures Roof Nails.xlsx** **(https://byui.instructure.com/courses/398828/files/159316668/download?wrap=1)** **(https://byui.instructure.com/courses/398828/files/159316668/download?download_frd=1)**

The data represents a study of the failure pressure of roof panels. A sample of 24 panels constructed with 8-inch nail spacing on the intermediate framing and another 24 panels constructed with 6-inch

spacing gave the results of the failure pressures in the file. We want to test if the 6-inch spacing provides a higher mean failure pressure.

Use this information for all the parts.

Question 5

1 / 1 pts

Part 1: What would be the null and alternative hypothesis?

- $H_0 : \mu_6 = \mu_8 H_0 : \mu_6 = \mu_8,\ H_1 : \mu_6 \neq \mu_8 H_1 : \mu_6 \neq \mu_8$
- $H_0 : \mu_6 = \mu_8 H_0 : \mu_6 = \mu_8, H_1 : \mu_6 > \mu_8 H_1 : \mu_6 > \mu_8$
- $H_0 : \mu_6 = \mu_8 H_0 : \mu_6 = \mu_8, H_1 : \mu_6 < \mu_8 H_1 : \mu_6 < \mu_8$
- $H_0 : \mu_d = 0 H_0 : \mu_d = 0, H_1 : \mu_d = 0 H_1 : \mu_d = 0$
- $H_0 : \mu_d = 0 H_0 : \mu_d = 0, H_1 : \mu_d > 0 H_1 : \mu_d > 0$
- $H_0 : \mu_d = 0 H_0 : \mu_d = 0, H_1 : \mu_d < 0 H_1 : \mu_d < 0$

Question 6

1 / 1 pts

Part 2: What is the p-value of the test?

0.443

Question 7

1 / 1 pts

Part 3: What is your conclusion at the 0.05 significance level?

- We have sufficient evidence to show that the 6-inch spacing provides a higher mean failure pressure.
- We have insufficient evidence to show that the 6-inch spacing provides a higher mean failure pressure.
- We have sufficient evidence to show that the 8-inch spacing provides a higher mean failure pressure.
- We have sufficient evidence to show that the 6-inch spacing provides a higher mean failure pressure.

Question 8

1 / 1 pts

Part 4: Assuming each sample was a simple random sample, are the requirements satisfied?

- No, both histograms (or QQ plots) appear to be left skewed.
- Yes, the histogram (or QQ plot) of the difference variable is normal.
- Yes the sample size is large.
- Yes the histogram (or QQ plot) of each variable looks normal.

A crayon manufacturer is comparing the effects of two kinds of yellow dye on the brittleness of the crayons. Dye B is more expensive than dye A. We want to test if there is a significant difference between the strength of each crayon dye. Six crayons are tested with each kind of dye, and the impact strength (in joules) is measured for each. The results are as follows.

Dye A: 1.0, 2.0, 1.3, 3.0, 2.2, 1.5

Dye B: 3.0, 3.2, 2.6, 3.4, 2.9, 1.8

Use this information for all the parts.

Question 9

1 / 1 pts

Part 1: What would be the null and alternative hypothesis?

- $\boldsymbol{H_0 : \mu_A = \mu_B} H_0 : \mu_A = \mu_B$, $\boldsymbol{H_1 : \mu_A < \mu_B} H_1 : \mu_A < \mu_B$
- $\boldsymbol{H_0 : \mu_A = \mu_B} H_0 : \mu_A = \mu_B$, $\boldsymbol{H_1 : \mu_A > \mu_B} H_1 : \mu_A > \mu_B$
- $\boldsymbol{H_0 : \mu_A = \mu_B} H_0 : \mu_A = \mu_B$, $\boldsymbol{H_1 : \mu_A \neq \mu_B} H_1 : \mu_A \neq \mu_B$
- $\boldsymbol{H_0 : \mu_d = 0} H_0 : \mu_d = 0$, $\boldsymbol{H_1 : \mu_d < 0} H_1 : \mu_d < 0$
- $\boldsymbol{H_0 : \mu_d = 0} H_0 : \mu_d = 0$, $\boldsymbol{H_1 : \mu_d > 0} H_1 : \mu_d > 0$
- $\boldsymbol{H_0 : \mu_d = 0} H_0 : \mu_d = 0$, $\boldsymbol{H_1 : \mu_d \neq 0} H_1 : \mu_d \neq 0$

Question 10

1 / 1 pts

Part 2: What is the test statistic for testing the above hypothesis?

-2.621

Question 11

1 / 1 pts

Part 3: What are the degrees of freedom?

9

Question 12

1 / 1 pts

Part 4: What is the p-value?

0.028

Question 13

1 / 1 pts

Part 5: What is your conclusion at the 0.05 significance level?

- (●) There is sufficient evidence to show that there is a difference between the two dyes.
- ( ) There is insufficient evidence to show that dye B produces stronger crayons.
- ( ) There is sufficient evidence to show that dye A produces stronger crayons.
- ( ) There is insufficient evidence to show that there is a difference between the two dyes.

Question 14

1 / 1 pts

Part 6: In order to check the requirements what would we have to check? **(Mark all that apply)**

- [x] That each dye was applied to a simple random sample of crayons.
- [ ] That the histogram for the difference column looks normal.
- [x] That the histogram for the data from dye A looks normal.
- [x] That the histogram for the data from dye B looks normal.
- [ ] We don't have to check anything in this case.

Question 15

1 / 1 pts

Part 7: Find a 99% confidence interval for the mean of the difference (Dye A - Dye B).

Enter the lower bound:

-2.202

Question 16

1 / 1 pts

Enter the upper bound:

0.236

Question 17

1 / 1 pts

Suppose that a confidence interval for the difference between the hourly wages of males and females in a certain company (Male wages minus female wages) was found to be ($0.74, $1.89), what does that tell you?

- ( ) There seems to be no difference between the hourly wage of females and males.
- ( ) The hourly wages of females seem to be significantly higher than the male wages.

- (●) The hourly wages of males seem to be significantly higher than the female wages.
- ( ) There is insufficient evidence to show that there is a difference between male and female hourly wages.

Quiz Score: 17 out of 17