L11 HW

- Due Feb 21 at 11:59pm
- Points 14
- Questions 14
- 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
LATEST	Attempt 1	16 minutes	14 out of 14

ⓘ Answers will be shown after your last attempt

Score for this attempt: 14 out of 14
Submitted Feb 20 at 1:09pm
This attempt took 16 minutes.

A new process for producing a type of novolac resin is supposed to have a mean cycle time of 3.5 hours per batch. Ten batches are selected at random and their cycle times, in hours, were recorded in the file: **CycleTimes.xlsx (https://byui.instructure.com/courses/398828/files/159316540/download?wrap=1)** **(https://byui.instructure.com/courses/398828/files/159316540/download?download_frd=1)** . The engineers tried to determine if the mean cycle time is greater than 3.5 hours. **Use this information to answer all parts.**

Question 1

1 / 1 pts

Part 1: What is their null and alternative hypothesis?

- $H_0 : \mu = 3.5$ vs. $H_a : \mu \neq 3.5$
- $H_0 : \mu = 3.5$ vs. $H_a : \mu < 3.5$
- $H_0 : \mu < 3.5$ vs. $H_a : \mu > 3.5$
- $H_0 : \mu = 3.5$ vs. $H_a : \mu > 3.5$

Question 2

1 / 1 pts

Part 2: What is the value of the test statistic?

1.203

Question 3

1 / 1 pts

Part 3: What is the degrees of freedom?

9

Question 4

1 / 1 pts

Part 4: What is the distribution of the test statistic?

- Normal
- Binomial
- Exponential
- T

Question 5

1 / 1 pts

Part 5: What is the p-value of the above test?

0.13

Question 6

1 / 1 pts

Part 6: What is your conclusion at the 0.05 significance level?

- The novolac resin definitely does not have a mean cycle time greater than 3.5 hours per batch.

- The novolac resin definitely has a mean cycle time equal 3.5 hours per batch.
- There is sufficient evidence to conclude that the novolac resin has a mean cycle time that is greater than 3.5 hours.
- There is insufficient evidence to conclude that the novolac resin has a mean cycle time that is greater than 3.5 hours.
- There is sufficient evidence to conclude that the novolac resin has a mean cycle time that is equal to 3.5 hours.
- There is insufficient evidence to conclude that the novolac resin has a mean cycle time that is equal to 3.5 hours.

As part of the quality-control program for a catalyst manufacturing line, the raw materials (alumina and a binder) are tested for purity. The process requires that the purity of the alumina be equal to 95%. To determine if that is the case, a random sample from a recent shipment of alumina yielded the following results (in percent) found in the file: **Alumina.xlsx** **(https://byui.instructure.com/courses/398828/files/159316486/download?wrap=1)** **(https://byui.instructure.com/courses/398828/files/159316486/download?download_frd=1)** . **Use this information for all the parts.**

Question 7

1 / 1 pts

Part 1: What is the value of the test statistic?

-2.806

Question 8

1 / 1 pts

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

0.023

Question 9

1 / 1 pts

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

- There is sufficient evidence to conclude that the purity of the alumina is not 95%.
- There is insufficient evidence to conclude that the purity of the alumina is not 95%.
- There is sufficient evidence to conclude that the purity of the alumina is equal to 95%.
- There is insufficient evidence to conclude that the purity of the alumina is equal to 95%.

Question 10

1 / 1 pts

Part 4: Without looking at the QQ plot, are the requirements satisfied here?

- Yes, it is a simple random sample and that is all we need.

- Yes, we rejected the null hypothesis, so that satisfies the requirements.
- No, the data is not a random sample.
- No, the histogram looks like it is right skewed, so the data is not normal.
- No, the histogram looks like it is left skewed, so the data is not normal.

Question 11
1 / 1 pts

Part 5: Find a 99% Confidence interval for the mean purity of alumina.

Enter the lower bound:

89.876

Question 12
1 / 1 pts

Input the upper bound:

95.457

Question 13
1 / 1 pts

Part 6: What is the margin of error in the confidence interval you found above?

2.791

Question 14
1 / 1 pts

Part 7: Suppose you decide to improve your results and go out to collect more data. You collect 10 more observations on the purity of alumina. When you compute a 99% confidence interval again, what would happen to each of the following?

Margin of error

would decrease

Width of the confidence interval

would decrease

Quiz Score: 14 out of 14