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**Question 6**

Answer saved

Marked out of 0.50

Assume that you are comparing the difference in means between two sets of data through a permutation test, which has given you a p value. If the significance level has been fixed at 0.05, which of the following statements are true?

Select one or more:

- ☐ a. If  $p < 0.05$ , there is no difference between the two sets of data.
- ☒ b. If  $p < 0.05$ , the two sets of data are statistically different.
- ☐ c. If  $p > 0.1$ , the two sets of data are statistically different.
- ☒ d. If  $p < 0.05$ , we reject the null hypothesis.
- ☐ e. If  $p < 0.05$ , we fail to reject the null hypothesis.
- ☒ f. If  $p > 0.1$ , there is no difference between the two sets of data.

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## Question 7

Incomplete answer

Marked out of 2.25

Using the data from the vehicles.csv file:

We want to know whether the new fleet is better than the old one (i.e., if the difference in the means is positive).

The Null hypothesis is:

- ☒ There is no difference between the mean MPG between the old and the new fleet
- ☐ The mean MPG in the new fleet is larger than the mean MPG for the old fleet

The alternative hypothesis is

- ☒ The mean MPG in the new fleet is larger than the mean MPG for the old fleet
- ☐ There is no difference between the mean MPG between the old and the new fleet

The p-value from a permutation test with 30000 permutations is  (give 3 decimal points, e.g., 0.456). Since this value is  0.01 (our significance level), we

- ☐ Fail to reject the null hypothesis
- ☐ Reject the Null hypothesis

If an error had occurred in our inference above, what type of error would it be?

- ☐ Type II error
- ☐ Type I error

Please answer all parts of the question.

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## Question 8

Not yet answered

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The data for this question is in [voting\\_data.py](#).

The file contains data for the 2008 US presidential election results from the “swing states” of PA and OH, specifically, the percentage of voters who voted for the Democrats within each county in a given state. There are  values (i.e., states) in PA and  in OH.

We want to know whether voters in PA were more likely than voters in OH to support the Democratic candidate.

The Null hypothesis is:

- ☐ There is no difference between the mean votes for PA and OH
- ☐ The mean in PA voting is larger than the mean in OH voting
- .

The alternative hypothesis is

- ☐ The mean in PA voting is larger than the mean in OH voting
- ☐ There is no difference between the mean votes for PA and OH
- .

The 95% confidence intervals for the means of the votes using 20000 bootstraps are (give two decimal values, e.g., 1.23):

For OH: (  ,  )

For PA: (  ,  )

The p-value from a permutation test with 10000 permutations is  (give 3 decimal points, e.g., 0.456). Since this value is  0.05 (our significance level), we

- ☐ Reject the null hypothesis
- ☐ Fail to reject the Null hypothesis
- .

If an error had occurred in our inference above, what type of error would it be?

- ☐ Type II error
- ☐ Type I error

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