





MAST20005, Sem 2 2020 Practice Lab Test

Statistics (University of Melbourne)

Practice Lab Test

Started: Oct 29 at 15:07

Quiz Instructions

- Marks will be awarded for answers only. There are no marks for giving the computer commands.
- You are expected to carry out calculations in R or RStudio. If you use other software packages you may not receive any marks for your work.
- Questions 1-5 refer to the data file: [HExer.txt](#) 
- Questions 6-10 refer to the data file: [sales.csv](#) 

Question 1

2 pts

This question refers to the data in the file *HExer.txt*, which shows the responses from a survey from 20 people about the time used for exercise in a week (denoted as HExer, in hours).

- Report the 5-number summary statistics (minimum, 1st quartile, median, 3rd quartile, maximum) of HExer.

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
6.080	7.375	10.310	9.526	11.570	12.560

p



14 words



Question 2**2 pts**

This question refers to the data in the file *HExer.txt*, which shows the responses from a survey from 20 people about the time used for exercise in a week (denoted as HExer, in hours).

- Assuming a normal distribution, calculate a 90% confidence interval for μ .

90 percent confidence interval:
8.631188 10.420812

p



6 words

**Question 3****2 pts**

This question refers to the data in the file *HExer.txt*, which shows the responses from a survey from 20 people about the time used for exercise in a week (denoted as HExer, in hours).

- Use a Wilcoxon test, with a significance level of 0.05, to test the claim that the median time used for exercise in a week is equal to 10 hours against a two-sided alternative. Clearly state the test you are using, the p-value, and your conclusion.

p



0 words



Question 4

2 pts

This question refers to the data in the file *HExer.txt*, which shows the responses from a survey from 20 people about the time used for exercise in a week (denoted as HExer, in hours).

- Let p be the proportion of people who exercise more than 10 hours a week. Calculate a 95% one-sided confidence interval with a lower bound for p .

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p



0 words



Question 5

2 pts

This question refers to the data in the file *HExer.txt*, which shows the responses from a survey from 20 people about the time used for exercise in a week (denoted as HExer, in hours).

- Researchers divide people into three groups according to hours of exercises taken in a week. The first group of people exercise less than 7 hours, the second group of people exercise between 7 and 10 hours, and the third group of people exercise more than 10 hours. Researchers are interested to see whether the population proportions of these groups are the same, and ask you for help. Test this hypothesis using a significance level of 0.01. Clearly state your method, the value of your test statistic and its null distribution, the p-value and your conclusion.

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p



0 words



Question 6

2 pts

This question refers to the data in the file *sales.csv* from a coffee shop. It shows the sales and the number of customers each day for three weeks.

- Fit a simple linear regression model that predicts the sales based on the number of customers. Use the usual parameterisation, $E(Y | X = x) = \alpha + \beta x$. Give point estimates of all three parameters in the model.

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Question 7**2 pts**

This question refers to the data in the file *sales.csv* from a coffee shop. It shows the sales and the number of customers each day for three weeks.

- Calculate a 95% confidence interval for β .

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p



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**Question 8****2 pts**

This question refers to the data in the file *sales.csv* from a coffee shop. It shows the sales and the number of customers each day for three weeks.

- You wish to predict the sales on a future day that when there will be 200 customers. Calculate a 90% prediction interval for the sales.

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0 words

**Question 9****2 pts**

This question refers to the data in the file *sales.csv* from a coffee shop. It shows the sales and the number of customers each day for three weeks.

- Damjan is wondering whether the typical number of customers differs between different days of the week. Test this hypothesis, using a significance level of 0.01. Clearly state your method, p-value and conclusion.

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p



0 words



Question 10

2 pts

This question refers to the data in the file *sales.csv* from a coffee shop. It shows the sales and the number of customers each day for three weeks.

- Tingjin wants to know whether the typical number of customers differs between weekdays and weekends. Test this hypothesis, using a significance level of 0.05. Clearly state your method, p-value and conclusion.

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p



0 words



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