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ECO 602

October 28, 2020

Individual assignment: Using Models 1

**Question 1: Catastrophic histogram:**

*Upload your image*

Chart, histogram

Description automatically generated

**Question 02: catastrophic normality test**

shapiro.test(catrate$cat.rate)

**Question 03: catastrophic normality results**

*1) What is the null hypothesis of the Shapiro Test?*

The data were sampled from a normally distributed population

*2) Based on the Shapiro test results, is there strong evidence that the sample came from a non-normally-distributed population?*

Yes, there is strong evidence that the data are from a non-normally distributed population. The p-value is 0.04097

**Question 04: one-sample t-test**

*1) State the null hypothesis of the test, in plain nontechnical English.*

The mean of the population that this set of data came from is normally distributed, meaning the data is roughly centered around some central value (the mean).

*2) Paste the code you used to conduct the t-test.*

t.test(x = catrate$cat.rate, y = NULL, mu = 2/7)

**Question 05: one-sample t-test interpretation**

*1) What is the p-value from your t-test?*

0.01193

*2) What is the confidence interval for the difference between the null hypothesis and alternative hypothesis means? Did it include zero?*

The confidence interval was 0.3526250 to 0.7261295. It did not include 0.

*3) Considering the results from your t-test, did you conclude that there was strong evidence to reject the null hypothesis?*  
Yes, there is strong evidence to reject the null hypothesis since the p-value is less than 0.05 and the confidence interval does not include zero. These are strong indicators that the difference in means is statistically significant, which is reason to reject the null hypothesis.

**Question 6: one-sample rank sum test**

*1) paste the line of code you used to conduct the test.*

wilcox.test(catrate$cat.rate, mu = 2/7)

**Question 7: one-sample rank sum test interpretation**

*1) what is the p-value from your test?*

0.006275

*2) Is there strong evidence to reject the null hypothesis?*

Yes, there is strong evidence to reject the null hypothesis because the p-value was much lower than 0.05, which indicates that the null hypothesis should be rejected.

**Question 8: one sample tests comparison**

*1) Considering the numerical and graphical data exploration, which test do you think was more appropriate for the data?*

Based on the visual appearance of the histrogram, the data does not seem to be normally distributed. This means that the non-parametric test for normality should be used (the Wilcoxon rank sum test).

*2) Compare the overall conclusions you could draw from the results of the two tests.*

Ultimately, we determined in both scenarios that the data are not normally distributed. However, the p-value for the parametric test was higher than the p-value for the non-parametric test, which makes me think that data that are even less normally distributed might pass a parametric test for normality but fail a non-parametric test, so you should always be sure to use the right test to make sure you get the right results.

**Question 9: flipper normality tests**

*1) Paste the code you used in the text box*

shapiro.test(dat\_adelie$flipper\_length\_mm)

shapiro.test(dat\_chinstrap$flipper\_length\_mm)

*2) Were the flipper lengths normally distributed for each species?*

Yes they were.

**Question 10: flipper histograms**

*1) upload your image file*

Chart, histogram

Description automatically generated

**Question 11: two-sample t-test**

*1) State the alternative hypothesis of the test in plain, nontechnical English*

The mean of one group of data is different from the mean of another, comparable group of data

*2) Paste the code you used to conduct the test*

t.test(penguin\_dat$flipper\_length\_mm ~ penguin\_dat$species)