due in 13hr 20m

Submission Phase

1. Do assignment ☐ (/statinference-006/human_grading/view/courses/972605/assessments/3/submissions)

Evaluation Phase

2. Evaluate peers 🔒 (/statinference-006/human_grading/view/courses/972605/assessments/3/peerGradingSets)

Results Phase

3. See results 🔒 (/statinference-006/human_grading/view/courses/972605/assessments/3/results/mine)

☐ In accordance with the Honor Code, I certify that my answers here are my own work, and that I have appropriately acknowledged all external sources (if any) that were used in this work.

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This is the project for the statistical inference class. In it, you will use simulation to explore inference and do some simple inferential data analysis. The project consists of two parts:

1. Simulation exercises.
2. Basic inferential data analysis.

You will create a report to answer the questions. Please use knitr to create the reports and convert to a pdf. (I will post a very simple introduction to knitr). **Each pdf report should be no more than 2 pages with 3 pages of supporting appendix material if needed (code, figures, etcetera).**

The exponential distribution can be simulated in R with rexp(n, lambda) where lambda is the rate parameter. The mean of exponential distribution is 1/lambda and the standard deviation is also also 1/lambda. Set lambda = 0.2 for all of the simulations. In this simulation, you will investigate the distribution of averages of 40 exponential(0.2)s. Note that you will need to do a thousand or so simulated averages of 40 exponentials.

Illustrate via simulation and associated explanatory text the properties of the distribution of the mean of 40 exponential(0.2)s. You should

1. Show where the distribution is centered at and compare it to the theoretical center of the distribution.
2. Show how variable it is and compare it to the theoretical variance of the distribution.
3. Show that the distribution is approximately normal.
4. Evaluate the coverage of the confidence interval for 1/lambda: $\bar{X} \pm 1.96 \frac{S}{\sqrt{n}}$.

B | *I* | Link | <code> | Math | Edit: Rich | Preview

Attach a file *(supports: txt, png, jpg, gif, pdf)*

Evaluation/feedback on the above work

Note: this section can only be filled out during the evaluation phase.

Regarding the distribution of the mean of 40 exponentials. Did the student show where the distribution is centered at and compare it to the theoretical center of the distribution?

Regarding the distribution of the mean of 40 exponentials. Did the student show how variable it is and compare it to the theoretical variance of the distribution?

Regarding the distribution of the mean of 40 exponentials. Did the student show that the distribution is approximately normal?

Did the students evaluate the coverage of the confidence interval for 1/lambda: $\bar{X} \pm 1.96 \frac{S}{\sqrt{n}}$.

Was the report created in knitr?

Here's your opportunity to give this project +1 for effort. Did the student basically try to answer the question?

Now in the second portion of the class, we're going to analyze the ToothGrowth data in the R datasets package.

1. Load the ToothGrowth data and perform some basic exploratory data analyses
2. Provide a basic summary of the data.
3. Use confidence intervals and hypothesis tests to compare tooth growth by supp and dose. (Use the techniques from class even if there's other approaches worth considering)
4. State your conclusions and the assumptions needed for your conclusions.

Evaluation/feedback on the above work

Note: this section can only be filled out during the evaluation phase.

Did the student perform an exploratory data analysis?

Did the student give a basic information summarizing the data set?

Did the student perform some relevant confidence intervals and/or tests?

Were the results of the tests and/or intervals interpreted in the context of the problem correctly?

Did the student investigate the assumptions needed for their conclusions?

Were multiple comparisons discussed appropriately?

Here's your opportunity to give this project +1 for effort. Did the student basically try to answer the question?

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