TERM PROJECT

INSTRUCTOR : AYKUT ŞEN

DUE DATE : JUNE 10th 2020, Wednesday

BLIND CROSS-GRADING DUE DATE : JUNE 15th 2020, Monday

Overview

- Students are expected to deliver the project that consists of two parts.
- The delivery must be in PDF format and must be prepared in knitr.
- The delivered documents must NOT contain any names or signs about the student since there will be a blind cross-grading among students.
- Number of pages must NOT exceed 5 for Part I and 10 for Part II. Keep in mind that bulk code makes the document look messy. Only show the code that you think is necessary and forms a key to the case.

Grading (For ADS 511)

A total of 40 points will be graded.

- 25 points will be from the achievement of the given objectives.
- 12 points will be from blind cross-grading. Each student will blind cross-grade 3 other students' work and rank them according to correctness, clearness, diversification and presentation of the case. There may be only one 1st, one 2nd and one 3rd rank and students must explain the factors for their ranking in a few sentences.
    - 4 pts will be rewarded to 1st rank
    - 2 pts will be rewarded to 2nd rank
    - No points will be rewarded to the 3rd rank
- 3 points will be from instructor evaluation of document layout, clearness, diversification and presentation of the case. The instructor will rank the students' work.
    - 3 pts will be rewarded to 1st rank
    - 2 pts will be rewarded to 2nd rank
    - 1 point will be rewarded to 3rd rank
    - No points will be rewarded to 4th rank

IMPORTANT NOTICE: For the sake of fairness, collective work or mutual blind cross-grading will be automatically ranked last when noticed.

Grading (For ADA 423)

A total of 40 points will be graded.

- 35 points will be from the achievement of the given objectives.
- 5 points will be from instructor evaluation of document layout, clearness, diversification and presentation of the case.

PART I

In this part, you are expected to apply Central Limit Theorem (CLT) to the exponential distribution in R and illustrate yielding a normal distribution from sample means. The mean and standard deviation of an exponential distribution are both $1/\lambda$ where λ is the rate parameter of the distribution. You will take $\lambda = 0.3$ for your work.

You can create samples from an exponential distribution using "rexp(m , λ)". You will use 50 as the sample size (m) where the number of samples for illustration is 1000. The minimum set of objectives is

- Calculate the resulting distribution mean and compare it to the projected mean
- Calculate the resulting distribution variance and compare it to the projected variance
- Show that the resulting distribution is approximately normal
- Repeat the steps to construct a distribution that approximates a standard normal distribution

PART II

ToothGrowth dataset in R is the result of an experiment which shows the tooth growth of 10 guinea pigs at three dosage levels (0.5 mg, 1 mg and 2mg) and two delivery methods (Vitamin C and Ascorbic Acid) of supplements.

In this part, you are expected to analyze ToothGrowth dataset and perform what you have learned during the term where applicable. The minimum set of objectives is

- Provide basic statistical info about the data
- Construct and apply Hypothesis Tests at your will
- Conduct ANOVA
- State your conclusions and provide any assumptions you made

Good Luck