Shiny Application Help Decument

Jinsong Zhang

The objectives of this application are to

- Illustrate how common distributions may be simulated by using computers
- Validate the Central Limit Theorem by sampling through generated observations
- Gain a better understanding of the statistics behind the common distributed samples

Introduction

- This application simulate the following common distributions: [1] “normal distribution” “poisson distribution” “binomial distribution” “negative binomial distribution” [5] “uniform distribution” “exponential distribution”
- The use has the ability to control the parameters of the distributions, for example, the mean and SD of the normal distribution, etc. “normal distribution” - mean, SD
  “poisson distribution” - lambda
  “binomial distribution” - probability
  “negative binomial distribution” - Dispersion [5] “uniform distribution” - min and max
  “exponential distribution” - rate
- The CLT is normally referred to the mean of a large number of independent random variables. Here, we will also test if it applies to the variance of the samples.

Tutorials

- The first step is to select a distribution at the left “selection” panel. Only one distribution may be selected at a time
- A reactive function in the server responds to the selection by updating the parameter selection specific to each distribution
- The use then select the parameters, including the sample size (“observation”)
- Histogram and probability distribution as a function of the number of observations are shown at the bottom left plot
- Next, the use selects the sampling size (default 40 should be less than the total observations) and the number of the sampling experiments
- The mean of the sampled observations is plotted at the middle
- The variance of the sampled observations is plotted at the right
- The red vertical line at the left denotes the mean of the observations and the mean and variance are given at the bottom
- it is evident that the mean and variance of the original sample population can be estimated by the mean and variance of simulated sample mean and variance
- Thus, CLT may not only applies to mean but also to the variance

The following files may be downloaed to deploy the server in your own computer

- ui.R ()
- server.R ()
- documentation ()
- open R console

- load “shiny” library
- type “runApp()”