UCS410: PROBABILITY AND STATISTICS

Laboratory Assignment – 3

Implement assignment 1 i.e. (random generation of student data for 6 subjects and 750 students) in R-Studio. But for the generation of random numbers explore various in-built function in R (like: rnorm, runif, sample, randu, etc.) in order to inculcate more randomness in data. Write a program in R to evaluate given data on following measure and try to understand their significance:

- Measures of central tendency: (Mean, Median, Mode)
- Measures of dispersion: (Range, Mean deviation, Standard deviation, Variance, Root mean square deviation)
- Draw Gaussian plots for each subject and try to identify type of skewness and kurtosis.

(Also try to perform above stated task using rattle API in R-studio)

Laboratory Assignment – 4

Q1) There are n people gathered in a room. What is the probability that at least 2 of them will have the same birthday?

- Use an R simulation to estimate this for various n.
- Find the smallest value of n for which the probability of a match is greater than .5.
- Explore how the number of trials in the simulation affects the variability of our estimates.

Q2) A friend has a coin with probability .6 of heads. She proposes the following gambling game. You will toss it 10 times and count the number of heads. The amount you win or lose on k heads is given by (k^2 -7k)

- Plot the payoff function.
- Make an exact computation using R to decide if this is a good bet.
- Run a simulation and see that it approximates your computation in part