Data Analytics – Lab Instruction 9

As seen in Lab 8, the proposed method of sampling from Gamma distribution, as the sum of Exponential random variables, would work if k is integer. Otherwise, with a non-integer parameter of α, we could use a Gamma distribution with parameters $[\alpha]$ and $\lambda - 1$, where $[\alpha]$ is the largest integer less than α.

Q1.

- Write R code to perform rejection sampling for a G(5.5,3) distribution. Here is the algorithm:
  - Call the pdf of G(5.5,3) as $f(x)$ and pdf of G(5,2) as $g(x)$.
  - Find $M = max\left(\frac{f(x)}{g(x)}\right)$.
  - Set $h(x) = M.g(x)$.
  - Generate samples (x_i, u_i) from g and $U\big(0, h(x_i)\big)$.
  - If $u_i > f(x_i)$, reject the sample, otherwise retain it.
- Generate a sample of 2000 from this distribution.
- Using Smirnov-Kolmogorov test, check if the samples follow G(5.5, 3).