
Q1: Generate a Uniform random variable $U[0\ \ 1]$ and plot $P(U > x)$, where $x \in (0.75\ 1)$

Q2: Write your own function to generate Exponential (X) and Poisson Random Variables (Z) from scratch and compare its `pdf` using any of the standard function available in `Python, Matlab or R`. Also, use $\mathbf{E[X]} = \mathbf{10}$ and $\mathbf{E[Z]} = \mathbf{10}$, and plot $\mathbf{P(X > x)}$ and $\mathbf{P(Z > z)}$, and produce the same with `Python, Matlab or R` to validate.

Q3: Simulate $M/M/1$-Queue using codes written in **Q1** and **Q2** considering an arrival rate $\lambda = 9$ and service rate $\mu = 10$. Plot the stationary probability that there are n customers, denoted as P_n in the system. In another plot, compare P_n for traffic intensity $\rho = 0.9, 0.5, 0.25$. For each implementation, compare the analytically obtained result, simulated result and the NS-3 simulator result. Plot all the results and discuss.