MTH 600: Computational Methods in Mathematics
Lab 3 Exercise

Question 1.

a). Implement the linear congruential generator algorithm to generate uniformly distributed random numbers on $[0,\ 1]$ with $a = 7^5$, $b = 0$ and $m = 2^{31} - 1$ by Matlab.

b). Generate $10,000$ random number using your program and compute the expectation and variance of these 10,000 random numbers.

c). Use Matlab command `rand` to generator $10,000$ random numbers, compute the expectation and variance and compare with the ones from (b).

Question 2.

a). Derive the cumulative density function of the exponential distribution with the probability density function $p(x) = 2e^{-2x}$.

b). Implement a random number generator for the exponential distribution via the inverse method.

c). Generate $10,000$ random number using your program and compute the expectation and variance of these 10,000 random numbers.

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