Assignment 8

Suppose you have to generate a sample using the algorithm given below:

Step 1: Generate a random sample u from *Uniform(0, 1)*;
Step 2: Compute $x = -(1/\gamma)\ \log_e(1-u)$;

Repeat the step 1 and step 2, n times and store the samples in an array say, X_1. Repeat the step 1 and step 2, n times again and store the samples in an another array say, X_2. Assume $\gamma = 2\ \&\ n = 100$ for both the executions. Find out the population mean and sample mean for X_1 and X_2.

How do you show that X_1 and X_2 are independent to each other programmatically, using the concept of marginal and joint distribution? Finally, compute the correlation between X_1 and X_2.