Assignment on Random Number Generation

1. Suppose G1, G2 and G3 are two seperate Congruential Generators. The specification and recursive relation of both generators are given below:

G1	$Z_{1,i}=(13Z_{1,i-1}+ 11Z_{1,i-2}+3) \bmod 16$, $Z_{1,0}=12$, $Z_{1,1}=7$ ($Z_{1,i}$ means Z_i of first CG)
G2	$Z_{2,i} = (12Z_{2,i-1}^2 + 13Z_{2,i-2}) \bmod 17$, $Z_{2,0}=3$, $Z_{2,1}=5$ ($Z_{2,i}$ means Z_i of second CG)
G3	$Z_{3,i} = (Z_{3,i-1}^3 + Z_{3,i-2}^2) \bmod 15$, $Z_{3,0}=2$, $Z_{3,1}=7$ ($Z_{3,i}$ means Z_i of Third CG)

   Now G1, G2 and G3 are combined together to generate a random number. Write a code to implement Wichman / Hill Method. Generate 100, 1000 and 5000 random numbers. Show a histogram,

   X -axis: index of a random number, i

   Y-axis: the random number Z_i

2. Generate random numbers using the Tausworthe generation technique.
   $r = 3$, $q = 5$, $l = 4$, first 5 bits are all 1 .
   Output: a sequence of random numbers between [0,1]
   Generate 1000 random numbers [0,1] and observe whether any cycle arrived.
   Show a histogram, X-axis : index of a random number, i

   Y-axis: the random number U_i

Submission Details:

1. A submission link has been opened on ELMS.
2. Write two codes in separate files. Then create a folder and put the code files into that folder. The folder name should be your student ID. Then Zip the folder and submit the zipped file to ELMS.
3. Do not copy code. Any kind of copy will carry negative marks.
4. You have to understand the codes properly. A personal viva will be taken while grading the assignment.
5. Deadline is not strict. But try to complete the assignments early, as you will face pressure if you keep the assignments for later.