# United International University (UIU)

Department of CSE

Trimester: Summer 2021

Course Name: CSI 424 | Simulation & Modeling Laboratory (Section B)

## Submission Guideline:

- Please solve the problem in a **colab notebook/python file**.
- In case of using a notebook, **download the python file** as instructed in the class. (File -> Download -> Download .py)
- Rename the file with your 9 digit student ID.
- **Submit the python file**.

Please do not copy codes from others/the internet. Each of the offline assignments will be evaluated with a viva. You must be able to explain your code. Also, we will run a copy checker on the submissions. Any plagiarism will be severely penalised.

**Offline assignment 4**

Suppose G1, G2 and G3 are three separate Congruential Generators. The specification and recursive relation of the generators are given below:

**G1:**

$Z_{1,i} = (13Z_{1,i-1} + Z_{1,i-2} + 3) \bmod 16$

$Z_{1,0} = 12, Z_{1,1} = 7$

($Z_{1,i}$ 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)

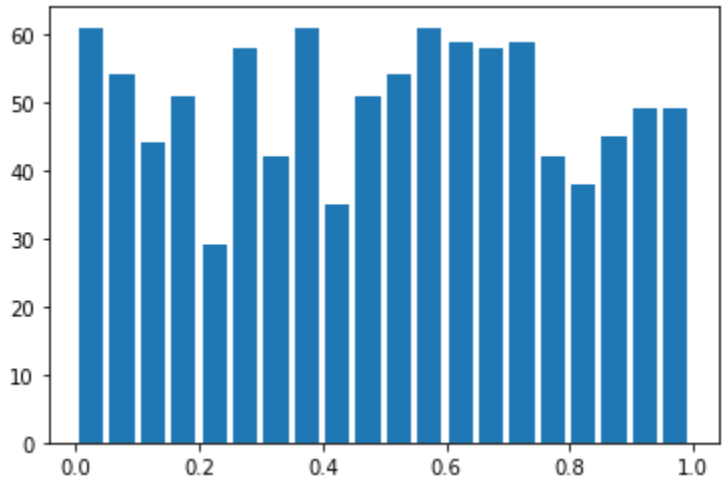
**G3:**

$Z_{3,i} = (Z_{3,i-1}^3 + Z_{3,i-2}) \bmod 15$

$Z_{3,0} = 2, Z_{3,1} = 7$

($Z_{3,i}$ means $Z_i$ of third CG)

Now G1, G2 and G3 are combined together to generate a random number ($U_i$).
Write a code to implement the **Wichmann-Hill Method**. Generate 100, 1000 and 5000 random numbers.
Show a histogram with all the generated random numbers for each case.
Example: (For 1000 random numbers)




[Use bins=20 in plt.hist() for getting 20 bars in the histogram.]