**Week 04: Due Date: Tuesday 06, 2024. Time 10 AM**

When you have completed the exercise, submit your responses (MS Word or PDF file) on Canvas. If you have any questions, ask your Teaching Assistants immediately! They are in the lab to help you learn the material.

**Challenge-1 What is this code doing?**

Execute the code for n=3, n=5, n=10. Show outputs for n=3, 5,10

Explain the functionality of RandomLinks function

function A = RandomLinks(n)

A= zeros(n,n);

for i = 1:n

for j = 1:n

r= rand();

if i ~= j && r <= 1/(1 + abs(i - j))

A(i,j)= 1;

end

end

end

Execute the code for n=3, n=5, n=10. Show outputs for n=3, 5,10

Explain the functionality of RandomLinks function

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The RandomLinks function creates a matrix of size n x n filling it initially with 0’s. It has a nested loop which creates a random number r. The 1:N means it will run the amount of times for what n is inputted as. If i is not equal to j and r less than or equal to 1/(1+ abs(i-j)) then call function A with i and j as inputs = 1.

**Challenge-2 Min and Max in a Matrix**

Write a function that will return minimum and maximum value of any Matrix (2 dimensional array). Do not use built-in functions: min and max

function B = minmax(n)

minV = 99

maxV = 0

for i = 1:n

for j = 1:n

if matrix(i,j) < minV

minV = matrix(i,j)

if matrix(i,j) > maxV

maxV = matrix(i,j)

end

end

end

**Challenge-3 roll\_2\_dice function**

Write a function ‘roll\_2\_dice’ which generates a simulation (with a specified seed) of two dice, take sum of them, and return sum in a row vector .

Inputs: N, seed

Output: d, which is 1 \* N vector

**Example:**

d= roll\_2\_dice(1,3000)

Here N=1. It means roll 2 dice once(N=1) and sum (lets say 3 +4 =7) will be returned in a row vector [7]

For N=2. It means roll 2 dice two times (N=2) and their sum ( lets say 3+4=7 & 5+6=11) will be returned in a row vector [7,11]

3000 is a seed value

Hint: Built-in functions **randi** & **rng**

function c = dice(n, seed)

rng(seed)

d = zeros(1,n)

for i = 1:n

d1 = randi(6)

d2 = randi(6)

d(i) = d1+d2

**Marks (Total 100) – Challenge-1 30, Challenge-2 30, Challenge-3 40**