



**School of Computing Science and Engineering**

**Lab exercise-5**

<b>Code/Course</b>	<b>:</b>	<b>CSE3020 – Data Visualisation</b>	<b>Date</b>	<b>:</b>	<b>01/03/2021</b>
<b>Lab Experiments</b>		<b>Constructing Networks and Graphs using <i>igraph</i> in R</b>	<b>Slot</b>	<b>:</b>	<b>L31+L32</b>

**Pre-requisite:** Moderately familiar with basic concepts in R, including variables and functions, and with RStudio, the integrated development environment for programming in R.

**Note:** Install and import the *igraph* package in R and Assume your own dataset (may be downloaded) wherever necessary.

1. Read the given adjacency matrix into R (adjacency.csv )
2. Read the given edge matrix into R(edges.csv)
3. Create and plot the graph from the adjacency matrix and edge matrix (customize the vertex color edge size, vertex frame and label)
4. Display the edges & vertices, the network as matrix and the names of vertices
5. Find the count of vertices and edges of the created graph
6. Display the adjacency vertices of each vertex(individual) in the created graph
7. Find the min and max degree of the created graph
8. Create & set vertex attribute property named **profit** and values("+", "-", "+", "-", "+", "-", "+", "-", "+")
9. Create & set vertex attribute property named **type** and values(either leap or non-leap year)
10. Create & set edge attribute named weight and values (if edge exists in between leap year vertices then 5 else 1 )
11. Convert the created un-directed graph into directed graph based on the following rule
  - a. edge directed towards high value vertex
  - b. if any one of the vertex is leap year then put the reverse edge with same weight.
12. Display the adjacency matrix of the resultant directed graph.
13. Display the in-degree and out-degree of each vertex of resultant directed graph