

## **CSP214 TASKs #6**

### **Task 6.1**

- a) Implement BFS algorithm of graph traversal. Display the order of the traversed vertices.
- b) Implement DFS algorithm to perform the traversal of a graph which generate the DFS forest. Display the finishing and discovery time of each vertex. Perform the classification of each edge of the graph. Determine whether the graph contains cycle or not?

### **Task 6.2**

Implement the Topological Sort algorithm. Mention the finishing time of each vertices. List all the possible topologically sorted ordering of graph's vertices.

### **Task 6.3**

Consider that you are provided a 8 x 8 table of natural numbers. Suppose that in any step you are allowed to either double each of the numbers in any one row, or subtract 1 from each of the numbers in any one column of the table. Write a program to translate the given original table into a table of all zeros. Determine the running time complexity of the devised algorithm.

### **Note:**

1. Make and use a function to generate graph dynamically and randomly considering the no of vertices and out-degree of each vertex, for the sufficient number of edges in the graph .
2. Create the program profile and analyze the running time of each implemented algorithms. Compile your code for doing the performance evaluation by using gprof.
3. Write your program using modules and multi-file programming approach i.e. your program file divided into multiple files and programs into modules.