LAB # 5:

DEPTH FIRST SEARCH FOR GRAPH AND TREE TRAVERSAL

Objectives:
- To implement depth first search (DFS) algorithm for graph and tree traversals using python

Hardware/Software Required:
Hardware: Desktop/ Notebook Computer
Software Tool: Python 2.7/ 3.6.2

Introduction:
Depth first search (DFS) is a recursive searching algorithm that uses the idea of backtracking. It involves exhaustive searches of all the nodes by going ahead, if possible, else by backtracking.
The recursive nature of DFS can also be implemented iteratively through Last In First Out (LIFO) structure.

Lab Tasks:

1. Implement a LIFO data structure in python.

2. Implement DFS algorithm recursively and iteratively in python.

3. Traverse Graph 1 and 2 through implemented DFS algorithm. The starting node is '6' for Graph 1 while the starting node is 'E' for Graph 2.

4. Traverse Tree 1 and 2 using Pre-Order, In-Order and Post-Order DFS traversals. The starting node is '1' for Tree 1 while the starting node is 'Frankfurt' for Tree 2.
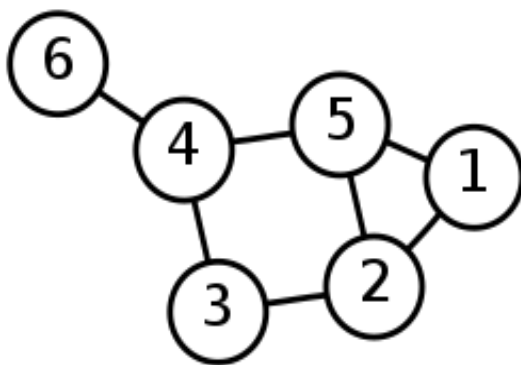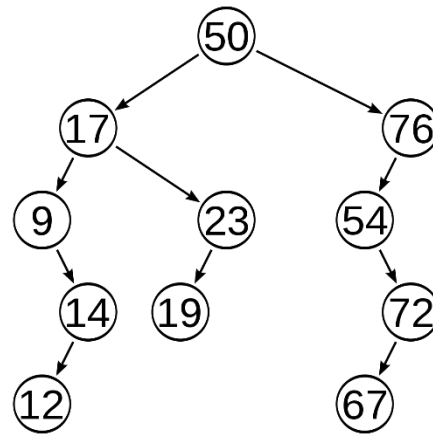

Graph 1
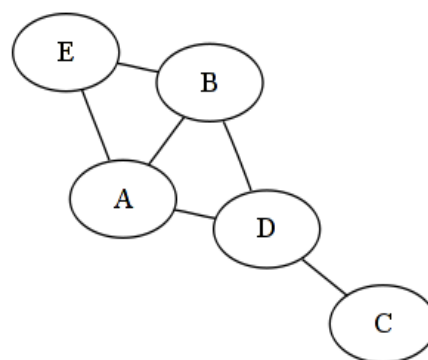
Graph 2
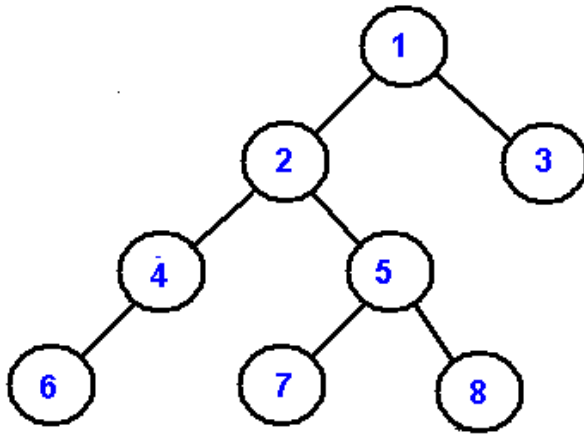
Tree 1   **Tree 2**

5. Write a script to decompose the given image into an undirected graph where the pixel represents the vertices and adjacent vertices are connected to each other via 4-connectivity. Use DFS algorithm to traversal decomposed image starting from pixel 150.

150	2	5
80	145	45
74	102	165

Conclusion:
Write the conclusion about this lab

NOTE: A lab journal is expected to be submitted for this lab.