22AIE203- DATASTRUCTURES & ALGORITHMS 2

LABSHEET 1

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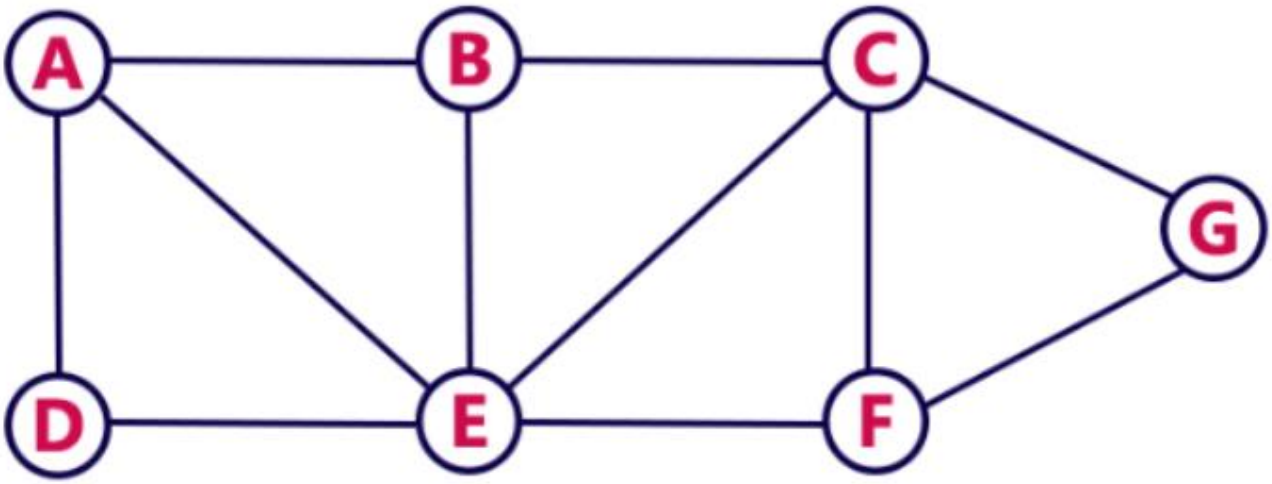

1. Breadth First Search :

```
visited = []
N = ["A","B","C","D","E","F","G"]
Q = []
Graph = [
    [0,1,0,1,1,0,0],
    [1,0,1,0,1,0,0],
    [0,1,0,0,1,1,1],
    [1,0,0,0,1,0,0],
    [1,1,1,1,0,1,0],
    [0,0,1,0,1,0,1],
    [0,0,1,0,0,1,0]
]

def Dequeue(Q):
    Q=Q[1:]
    return Q

def BFS_Search(Q):
    for v in N:
        if v not in visited:
            BFS(Q,v)

def BFS(Q,v):
```

```
    visited.append(v)
    Q.append(v)

    while len(Q) != 0:
        u = Q[0]
        Q = Dequeue(Q)
        pos = 0
        adj = Graph[N.index(u)]
        for i in adj:
            if i:
                w = N[pos]
                if w not in visited:
                    visited.append(w)
                    if w not in Q:
                        Q.append(w)

            pos+=1

BFS_Search(Q)
print(visited)
```

Output:

```
['A', 'B', 'D', 'E', 'C', 'F', 'G']
```

2. Depth First Search:

```
visited = []
N = ["A","B","C","D","E","F","G"]
Graph = [
    [0,1,0,1,1,0,0],
    [1,0,1,0,1,0,0],
    [0,1,0,0,1,1,1],
    [1,0,0,0,1,0,0],
    [1,1,1,1,0,1,0],
    [0,0,1,0,1,0,1],
    [0,0,1,0,0,1,0]
]

def DFS_Search():
    for v in N:
        if v not in visited:
            DFS(v)

def DFS(v):
    visited.append(v)
    pos = 0
    adj = Graph[N.index(v)]
    for i in adj:
        if i:
```

```
            w = N[pos]
            if w not in visited:
                DFS(w)
        pos+=1

DFS_Search()
print(visited)
```

Output:

```
['A', 'B', 'C', 'E', 'D', 'F', 'G']
```