Artificial Intelligence Lab

Assignment 1

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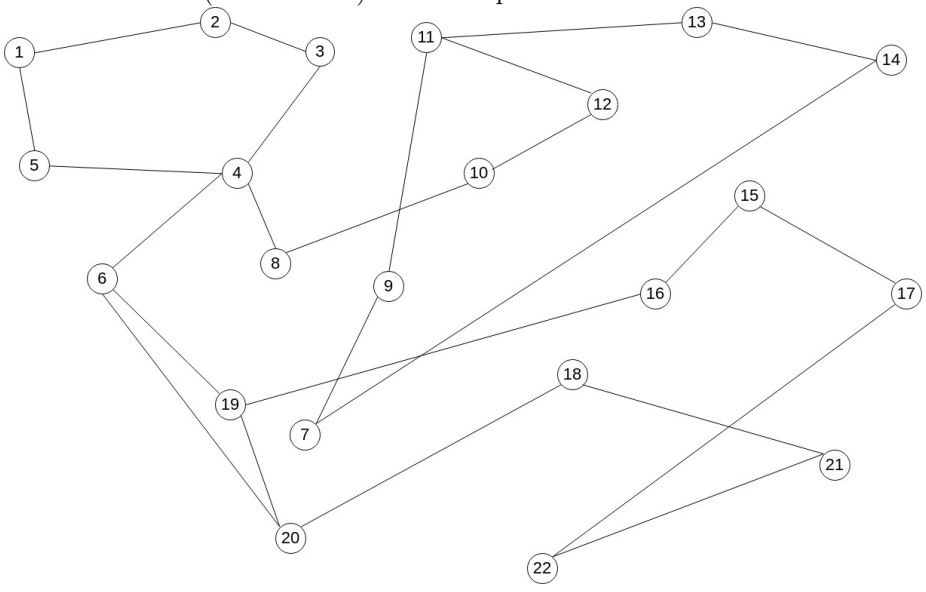
Algorithm	Nodes Visited	Height Traversed
BFS	5	5
DFS	5	5
DFID	13	5

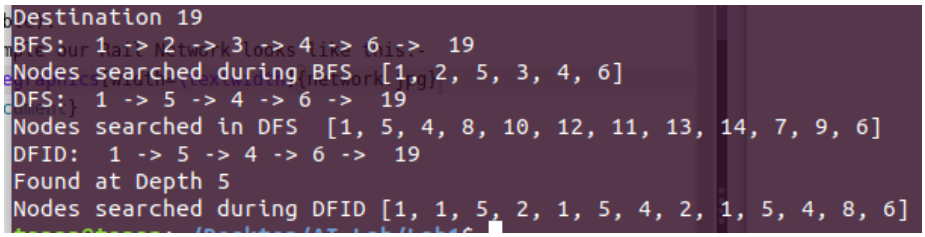
Table 1 : Exhaustive Algorithm Comparison for Path Traversal for Starting Station (1) and Destination (19)

1 Description about Domain:-

Travelling of passengers from one station to another station by the means of rail transport. Given Start state as the Boarding Station, the Goal state as the Destination Station and the link between available Stations, we have to find the viable route between them(if achievable). for Example our Rail Network looks like this:-



The output for Starting Station as (1) and Destination Station as (19)



The above Output shows the traced path of BFS(Breadth First Search) ,DFS(Depth First Search) and DFID(Depth First Iterative Deepening) Algorithm from Start State to Goal State. In case of BFS, it does not depend on the order which states are searched whereas in case of DFS and DFID number of states visited to reach the Goal State is dependent on order in which states are searched.
Below is pseudo code for DFID, for code refer to python code attached with it.

```
//returns True if Goal is found else False
dfid(mat,curr,dest,depth):
    level=0
    put curr in queue
    while queue not empty:
        top = queue.pop()
        level = level+1 //current level searching
        for i in range(len(mat)):
            if(mat[top][i]==1): //checks in adjancy matrix
                continue
            else:
                if(i not in queue):
                    if(level<=depth): //if current level is less
                        queue.append(i)//than depth add i to it
                if(i==dest)    //if destination is found
                    found=true
                    return True
                    break
    if(not found)
            return False
```