Name: Shaikh Mohd Raza

Roll No: 20CO53

Experiment No: 03

**Aim:**

Program on uninformed bfs and dfs.

**BFS:**

Breadth-first search (BFS) is an algorithm that is used to graph data or search trees or traversing structures. The full form of BFS is the Breadth-first search.

The algorithm efficiently visits and marks all the key nodes in a graph in an accurate breadthwise fashion. This algorithm selects a single node (initial or source point) in a graph and then visits all the nodes adjacent to the selected node. Remember, BFS accesses these nodes one by one.

Once the algorithm visits and marks the starting node, then it moves toward the nearest unvisited nodes and analyses them. Once visited, all nodes are marked. These iterations continue until all the nodes of the graph have been successfully visited and marked.

*CODE :-*

graph = {

'5' : ['3','7'],

'3' : ['2', '4'],

'7' : ['8'],

'2' : [],

'4' : ['8'],

'8' : []}

visited = []

queue = []

def bfs(visited, graph, node):

visited.append(node)

queue.append(node)

while queue:

m = queue.pop(0)

print (m, end = " ")

for neighbour in graph[m]:

if neighbour not in visited:

visited.append(neighbour)

queue.append(neighbour)

print("Following is the Breadth-First Search")

bfs(visited, graph, '5')

OUTPUT:

A B C D E F

*DFS:-*

DFS is an algorithm for finding or traversing graphs or trees in depth-ward direction. The execution of the algorithm begins at the root node and explores each branch before backtracking. It uses a stack data structure to remember, to get the subsequent vertex, and to start a search, whenever a dead-end appears in any iteration. The full form of DFS is Depth-first search.

*CODE :-*

graph = {

'5' : ['3','7'],

'3' : ['2', '4'],

'7' : ['8'],

'2' : [],

'4' : ['8'],

'8' : []

}

visited = set()

def dfs(visited, graph, node):

if node not in visited:

print (node)

visited.add(node)

for neighbour in graph[node]:

dfs(visited, graph, neighbour)

print("Following is the Depth-First Search")

dfs(visited, graph, '5)

OUTPUT :-

Following is the Depth-First Search

5

3

2

4

8

7

CONCLUSION :-

In this experiment we learned about the uninformed search algorithm ie depth-first search (dfs) and breadth-first search (bfs). Where bfs uses queue and dfs uses stack data structure. BFS is more suitable for searching vertices which are closer to the given source. And DFS is more suitable when there are solutions away from source. We implemented this uninformed search algorithm with python.