Date 02/03/2024

8.Aim: Write the python program to implement DFS.

Program:

```
from collections import defaultdict


class Graph:
    def __init__(self):
        self.graph = defaultdict(list)

    def add_edge(self, u, v):
        self.graph[u].append(v)

    def dfs_util(self, node, visited):
        visited[node] = True
        print(node, end=" ")

        for neighbor in self.graph[node]:
            if not visited[neighbor]:
                self.dfs_util(neighbor, visited)

    def dfs(self, start):
        visited = [False] * (max(self.graph) + 1)
        self.dfs_util(start, visited)

# Example usage:
if __name__ == "__main__":
    graph = Graph()
    graph.add_edge(0, 1)
    graph.add_edge(0, 2)
```

```
graph.add_edge(1, 2)

graph.add_edge(2, 0)

graph.add_edge(2, 3)

graph.add_edge(3, 3)


print("Depth First Traversal starting from vertex 2:")

graph.dfs(2)
```

Output:

```
========== RESTART: C:/Users/9550449358/OneDrive/Desktop/ai/8.dfs.py ==========
Depth First Traversal starting from vertex 2:
2 0 1 3
```

Result: The given program has been executed successfully