Experiment: 1.2

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1. **AIM:** *Implement the DFS algorithm and analyze its performance and characteristics*

2. **Objective:** *The objective of this experiment is to implement the Depth-First Search (DFS) algorithm and analyze its performance and characteristics.*

3. **Tools/Resource Used:**

1. Python programming language.
2. VS Code.

4. **Algorithm:**

1).Choose a node as the starting point for traversal.
2).Create an empty set to track visited nodes.
3).DFS Function:

- *If the current node is not visited:*
- *Mark the current node as visited.*
- *Print its value.*
- *For each unvisited neighbor:*
  - *Recursively perform DFS on the neighbor.*

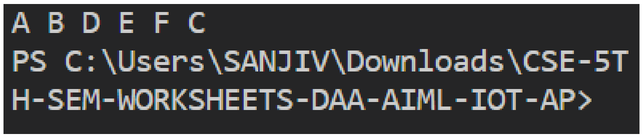
4).Begin DFS from the chosen starting node using the DFS function.
5).Explore as deeply as possible before backtracking to unexplored neighbors.
6).Stop when all reachable nodes are visited.

5. Program Code:

```
def dfs(graph, node, visited):
    if node not in visited:
        print(node, end=" ")
        visited.add(node)
        neighbors = graph[node]
        for neighbor in neighbors:
            dfs(graph, neighbor, visited)

graph = {
    'A': ['B', 'C'],
    'B': ['D', 'E'],
    'C': ['F'],
    'D': [],
    'E': ['F'],
    'F': []
}
visited = set()
dfs(graph, 'A', visited)
```

6. Output/Result:



```
A B D E F C
PS C:\Users\SANJIV\Downloads\CSE-5T
H-SEM-WORKSHEETS-DAA-AIML-IOT-AP>
```

7. Learning Outcomes:

1. *Implement a depth-first traversal (DFS) algorithm on a graph data structure.*
2. *Understand the concept of graph traversal and its importance in various applications.*
3. *Use recursion effectively to navigate through graph nodes and explore their connections.*