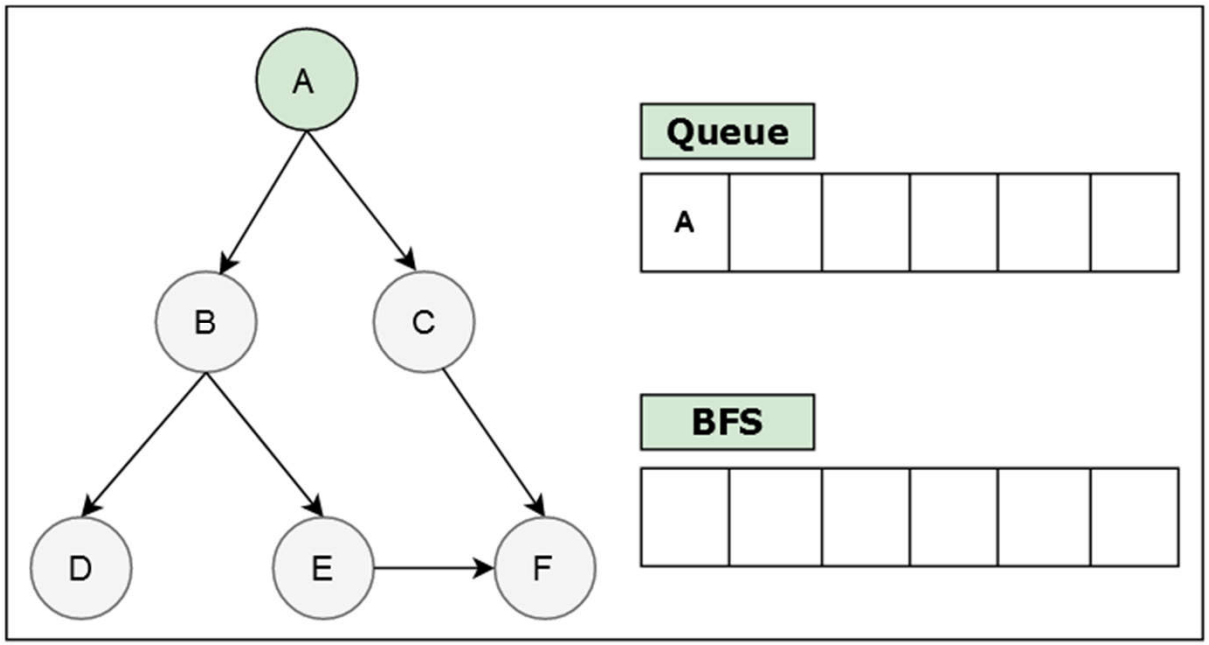
AI LAB WEEK 4

Dr. Mubashir Ahmad

BREADTH FIRST SEARCH PYTHON IMPLEMENTATION



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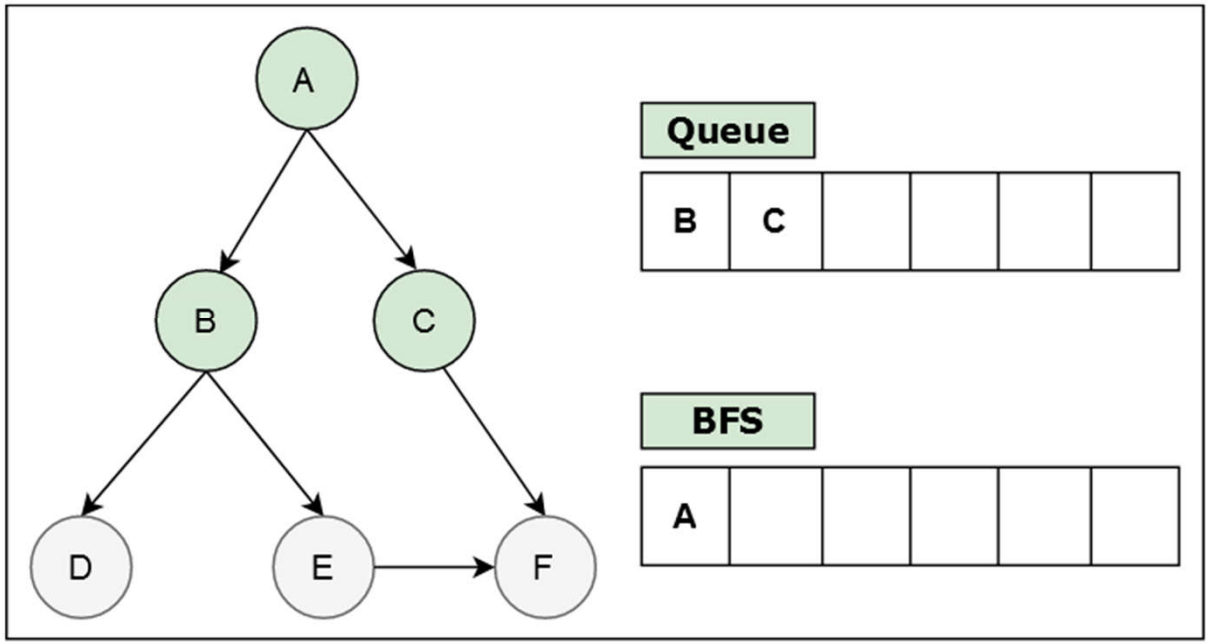

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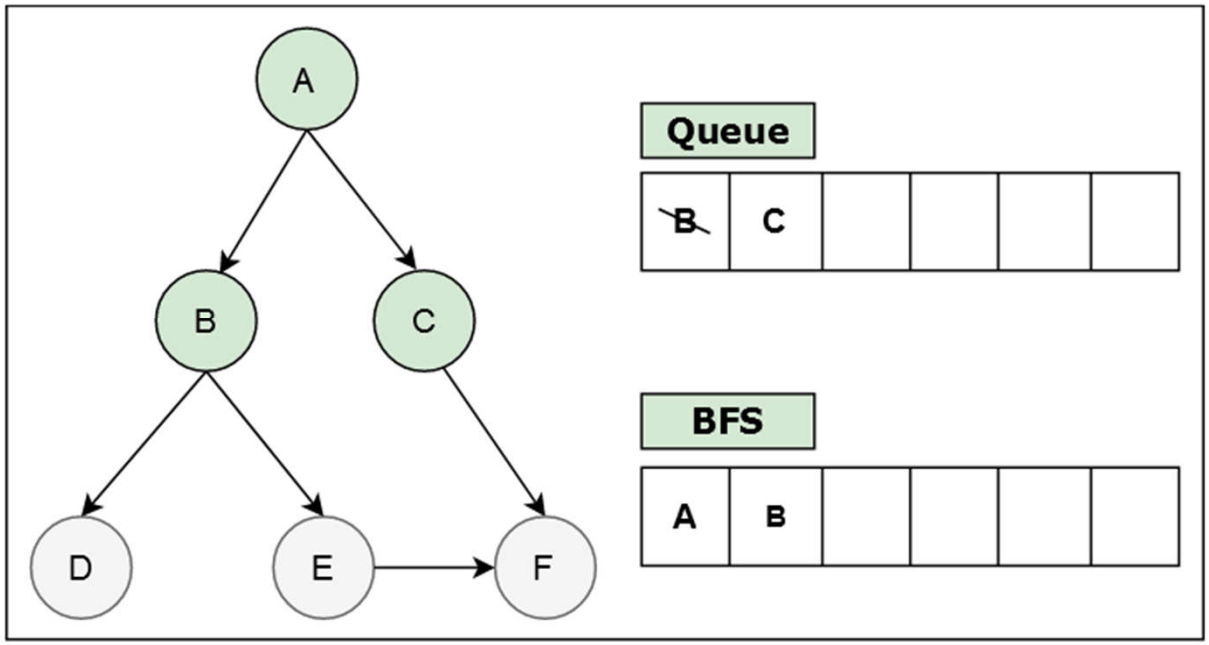

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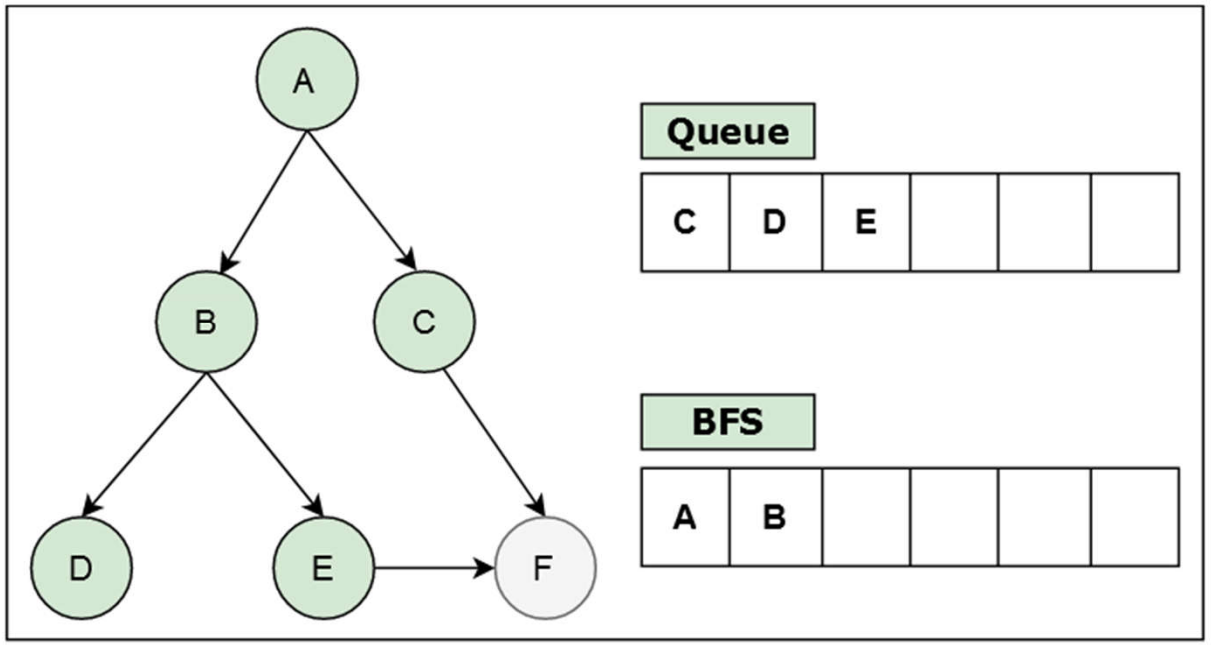

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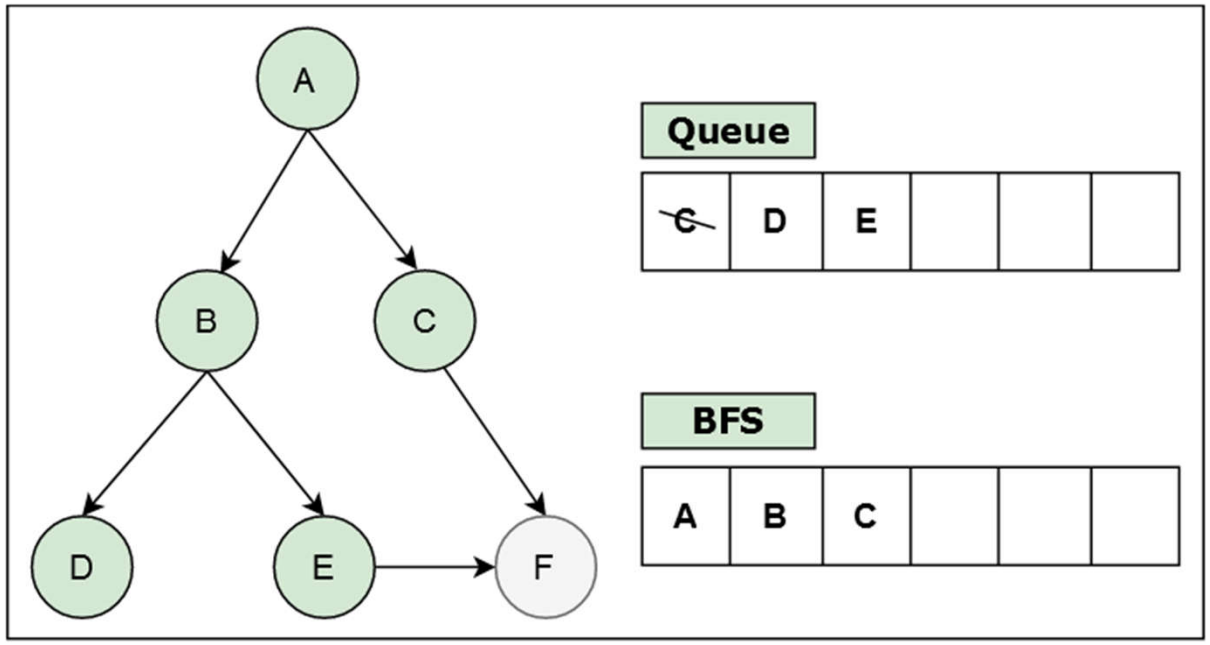

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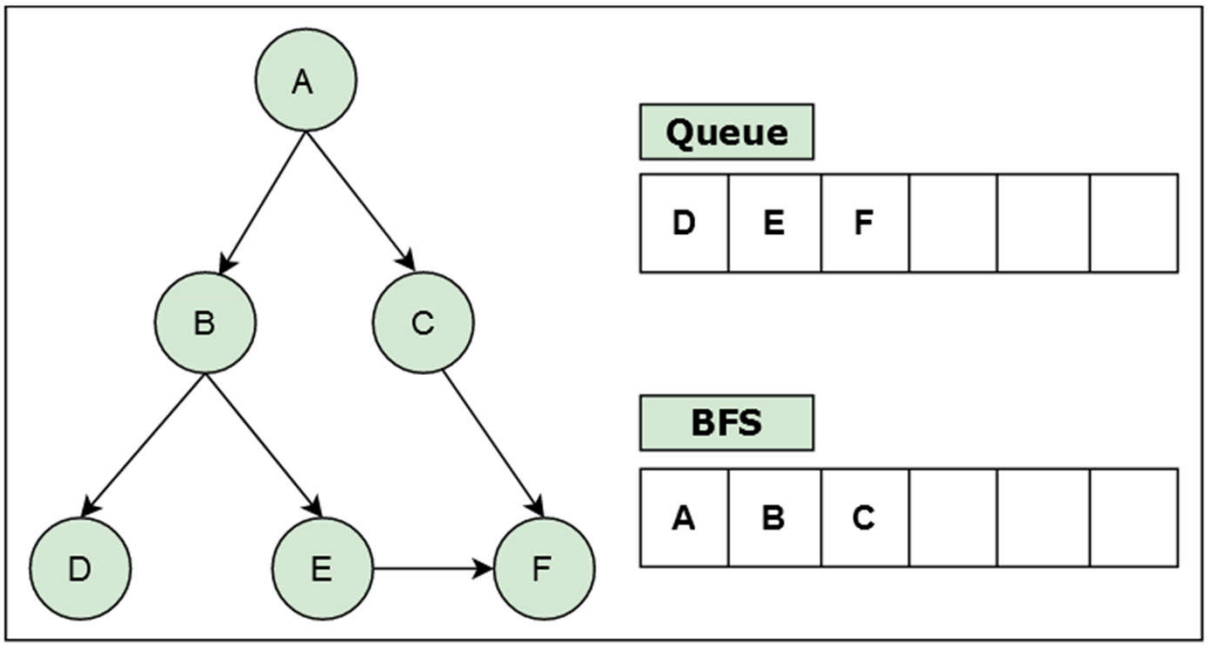

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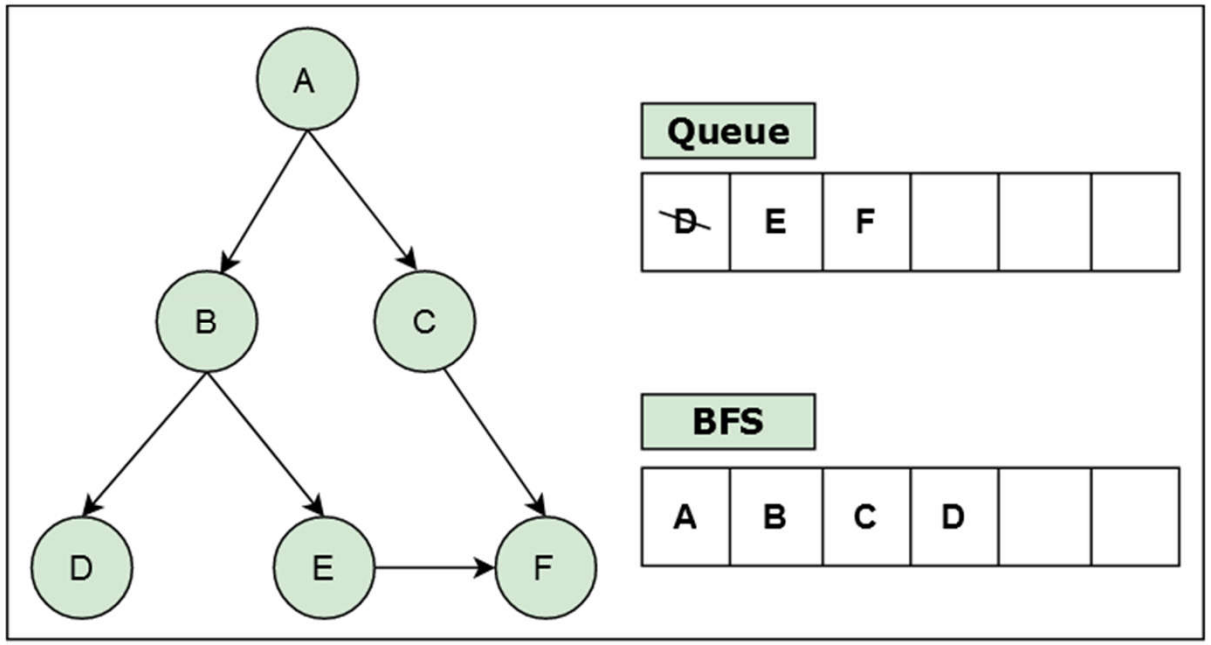

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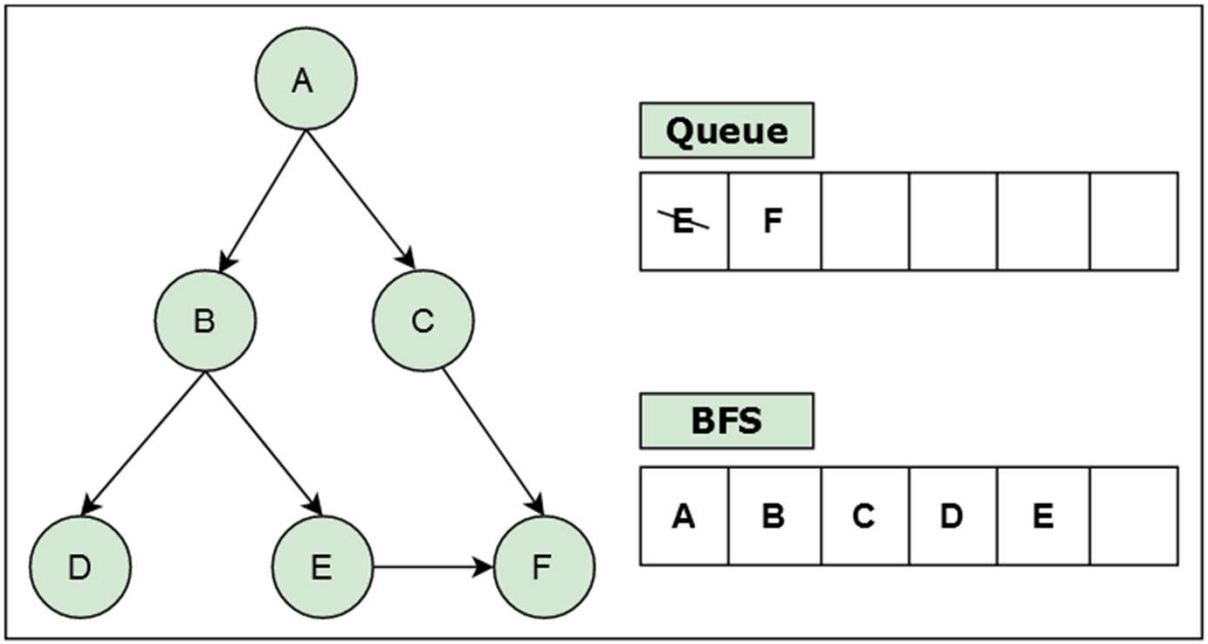

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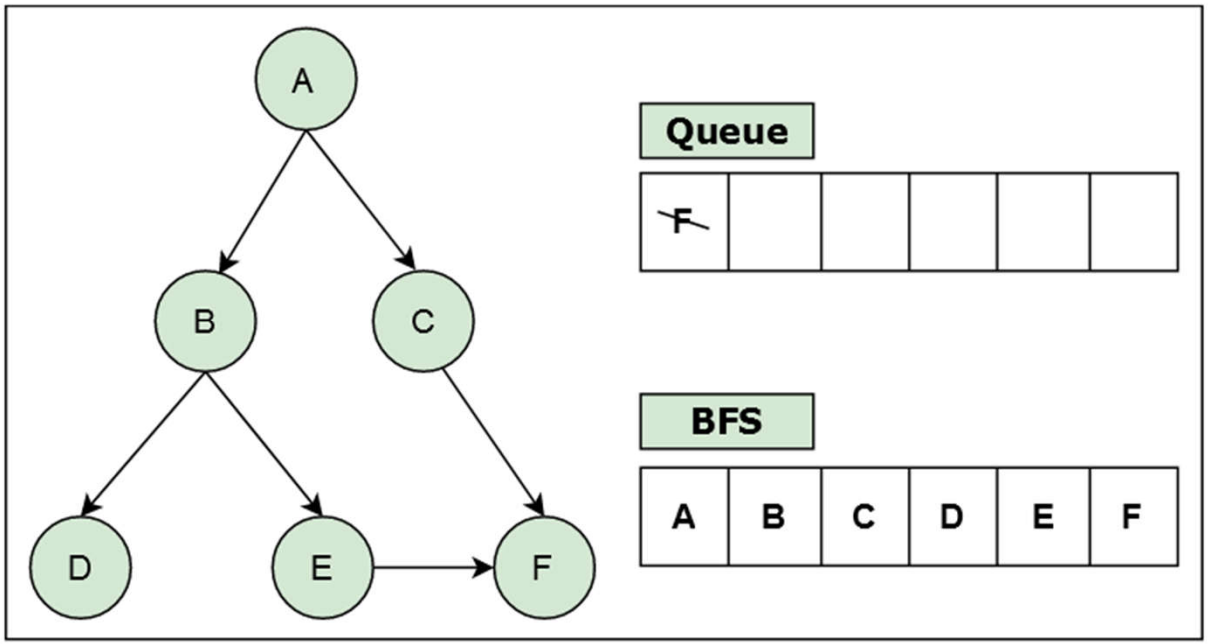

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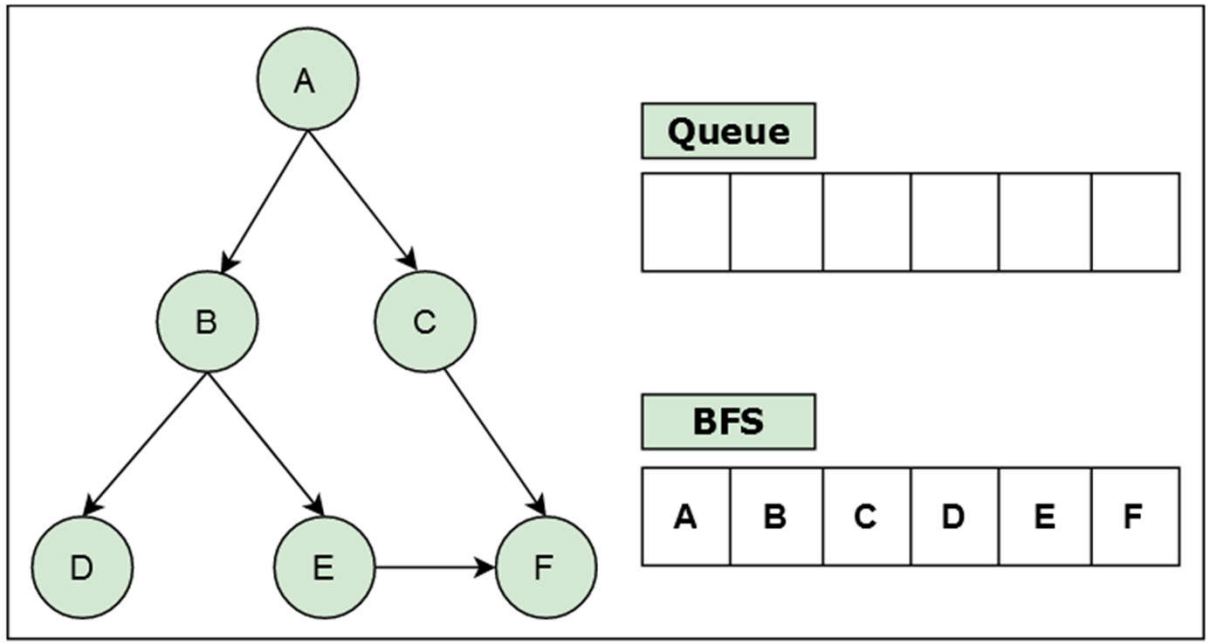


```python
graph = {
  'A' : ['B','C'],
  'B' : ['D', 'E'],
  'C' : ['F'],
  'D' : [],
  'E' : [],
  'F' : []
}

visited = [] # List to keep track of visited nodes.
queue = []     #Initialize a queue

def bfs(visited, graph, node):
  visited.append(node)
  queue.append(node)

  while queue:
    s = queue.pop(0)
    print (s, end = " ")

    for neighbour in graph[s]:
      if neighbour not in visited:
        visited.append(neighbour)
        queue.append(neighbour)

# Driver Code
bfs(visited, graph, 'A')
```

```python
graph = {
  'A' : ['B','C'],
  'B' : ['D', 'E'],
  'C' : ['F'],
  'D' : [],
  'E' : ['G'],
  'F' : ['H', 'I']
}

visited = [] # List to keep track of visited nodes.
queue = []     #Initialize a queue

def bfs(visited, graph, node, goal):
    visited.append(node)
    queue.append(node)

    while queue:
        s = queue.pop(0)
        print(s, end=" ")

        if s == goal:
            print("\nGoal state reached:", goal)
            return

        for neighbour in graph[s]:
            if neighbour not in visited:
                visited.append(neighbour)
                queue.append(neighbour)

# Driver Code
bfs(visited, graph, 'A', 'G')
```

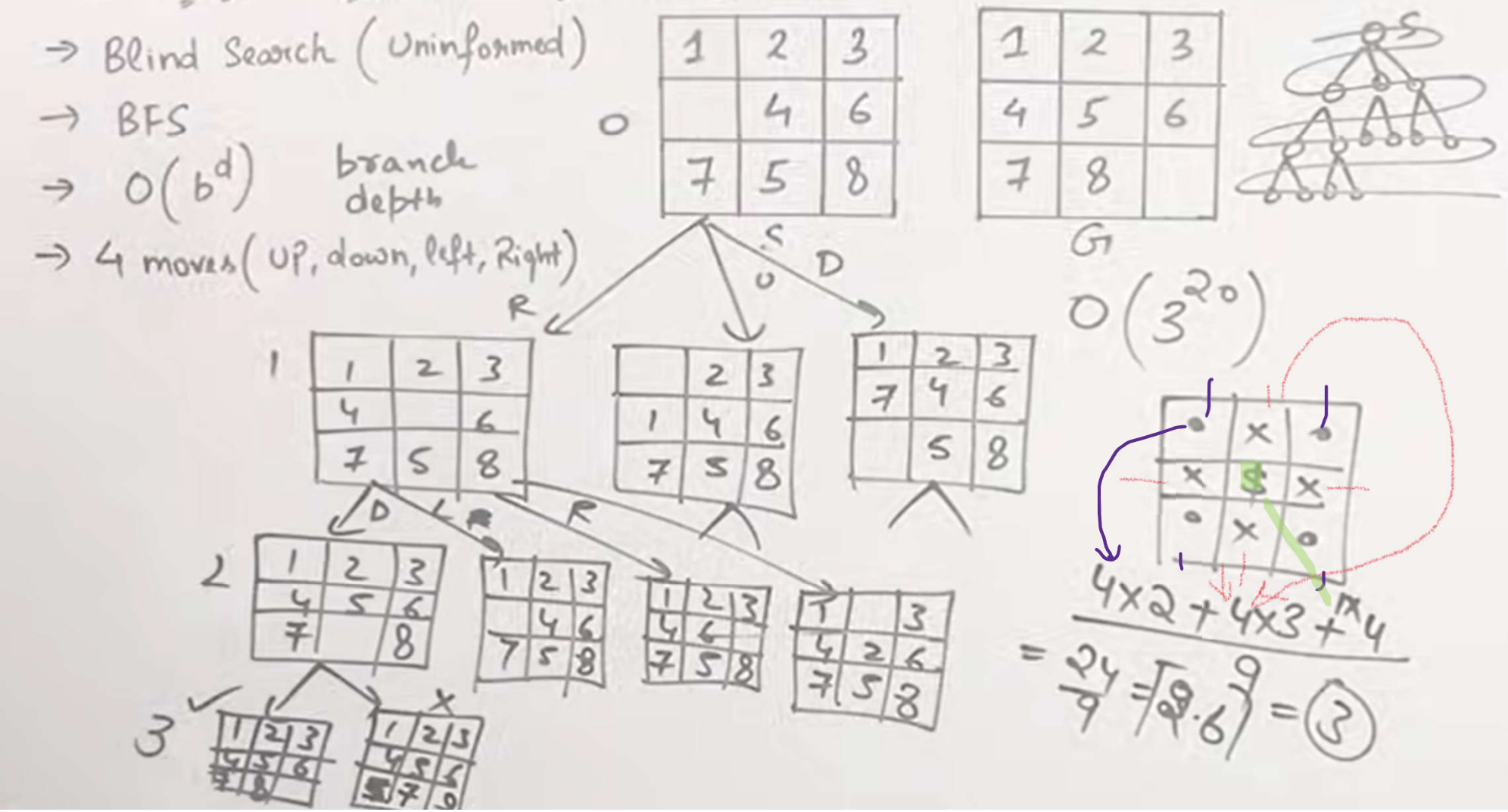
8-Puzzle Problem without Heuristic

→ Blind Search (Uninformed)

→ BFS

→ $O(b^d)$ b = branch, d = depth

→ 4 moves (Up, down, left, Right)



TASKS

#1. Using DFS find the goal state (Python Implementation).

#2. Implementation of DFS to traverse each node.

#3. Implementation of Sliding puzzle using DFS.