**Riphah International University**

**Artificial Intelligence (AI)**

**Lab 4**

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**Lab**

**BFS**

from collections import deque

def bfs(graph, start):

    visited = set()

    queue = deque([start])

    visited.add(start)

    counter = 0

    while queue:

        vertex = queue.popleft()

        print(vertex, end=' ')

        counter += 1

        for neighbor in graph[vertex]:

            if neighbor not in visited:

                queue.append(neighbor)

                visited.add(neighbor)

    return counter

graph = {

    5: [3, 7],

    3: [2, 4],

    7: [8],

    2: [],

    4: [8],

    8: [],

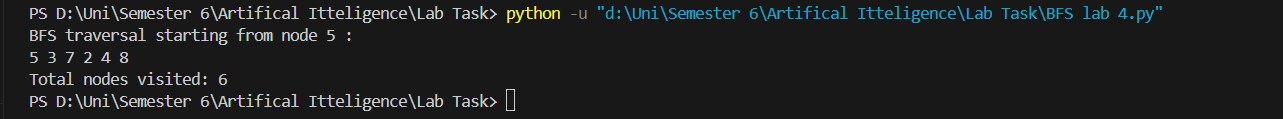
}

start\_node = 5

print("BFS traversal starting from node", start\_node, ":")

total\_visited = bfs(graph, start\_node)

print("\nTotal nodes visited:", total\_visited)



DFS

from collections import deque

def dfs(graph, start, visited=None, counter=None):

    if visited is None:

        visited = set()

    if counter is None:

        counter = [0]

    visited.add(start)

    print(start, end=' ')

    counter[0] += 1

    for neighbor in graph[start]:

        if neighbor not in visited:

            dfs(graph, neighbor, visited, counter)

graph = {

    5: [3, 7],

    3: [2, 4],

    7: [8],

    2: [],

    4: [8],

    8: [],

}

start\_node = 5

print("DFS traversal starting from node", start\_node, ":")

counter = [0]

dfs(graph, start\_node, counter=counter)

print("\nTotal nodes visited:", counter[0])

