exp_4_bfs

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1 Experiment 4: Part 1: BFS Algorithm

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[1]:
```python
# Implement BFS (Breadth First Search) algorithm to find the shortest path
# between two nodes in a graph.

def bfs(graph, start, end):
    visited = []
    queue = [[start]]
    if start == end:
        return "Start = End"
    while queue:
        path = queue.pop(0)
        node = path[-1]
        if node not in visited:
            neighbours = graph[node]
            for neighbour in neighbours:
                new_path = list(path)
                new_path.append(neighbour)
                print(f"Updated path is {new_path}")
                queue.append(new_path)
                if neighbour == end:
                    return new_path
            visited.append(node)
            print(f"Visited nodes currently: {visited}")
    return "Unreachable"


if __name__ == "__main__":
    graph = {
        'A': ['B', 'C'],
        'B': ['A', 'D', 'E'],
        'C': ['A', 'F'],
        'D': ['B'],
        'E': ['B', 'F'],
```

```
    'F': ['C', 'E']
}

graph2 = {
    '5': ['3', '7'],
    '3': ['2', '4'],
    '7': ['8'],
    '2': [],
    '4': ['8'],
    '8': []
}
print(bfs(graph2, '5', '8'))
# print(bfs(graph, 'A', 'D'))
# print(bfs(graph, 'A', 'A'))
# print(bfs(graph, 'A', 'Z'))
```

```
Updated path is ['5', '3']
Updated path is ['5', '7']
Visited nodes currently: ['5']
Updated path is ['5', '3', '2']
Updated path is ['5', '3', '4']
Visited nodes currently: ['5', '3']
Updated path is ['5', '7', '8']
['5', '7', '8']
```

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