

Problem – 6 : Topological Sort (BFS)

```
from collections import defaultdict, deque
```

```
def topological_sort_bfs(graph):
```

```
    in_degree = {node: 0 for node in graph}
```

```
    for node in graph:
```

```
        for neighbor in graph[node]:
```

```
            in_degree[neighbor] += 1
```

```
    queue = deque()
```

```
    for node in in_degree:
```

```
        if in_degree[node] == 0:
```

```
            queue.append(node)
```

```
    topological_order = []
```

```
    while queue:
```

```
        node = queue.popleft()
```

```
        topological_order.append(node)
```

```
        for neighbor in graph[node]:
```

```
            in_degree[neighbor] -= 1
```

```
            if in_degree[neighbor] == 0:
```

```
                queue.append(neighbor)
```

```
    if len(topological_order) != len(graph):
```

```
        # The graph contains cycles, so topological sort is not possible
```

```
        return None
```

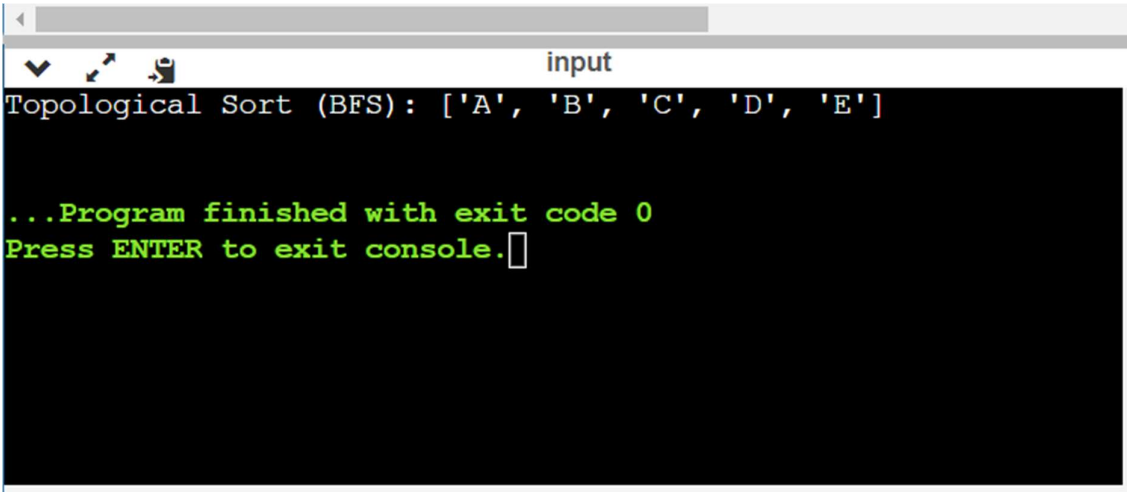
```
    return topological_order
```

```
graph = {
```

```
    'A': ['B', 'C'],
```

```
'B': ['D'],  
'C': ['D'],  
'D': ['E'],  
'E': []  
}
```

```
result = topological_sort_bfs(graph)  
if result is not None:  
    print("Topological Sort (BFS):", result)  
else:  
    print("The graph contains cycles. Topological Sort is not possible.")
```



The screenshot shows a terminal window with a title bar that includes a close button, a maximize button, and a window icon, followed by the title "input". The terminal content displays the output of a topological sort algorithm: "Topological Sort (BFS): ['A', 'B', 'C', 'D', 'E']". Below this, a green message states "...Program finished with exit code 0", and another green message prompts "Press ENTER to exit console." with a cursor icon at the end.

```
input  
Topological Sort (BFS): ['A', 'B', 'C', 'D', 'E']  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```