

# ASANSOL ENGINEERING COLLEGE

## COMPARATIVE STUDY BETWEEN BFS AND DFS

---

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING

SUBJECT CODE: PEC-IT601A

STUDENT NAME: TANYA KUMARI

ROLL NUMBER: 10800122138



# INTRODUCTION

---

- Breadth-First Search (BFS) and Depth-First Search (DFS) are fundamental graph traversal algorithms used in computer science. They help in searching and traversing tree/graph data structures.

# WHAT IS BFS?

---

- Breadth-First Search (BFS) explores all the nodes at the present depth level before moving to nodes at the next depth level. It uses a queue data structure.

# WHAT IS DFS?

---

- Depth-First Search (DFS) explores as far as possible along each branch before backtracking. It uses a stack (or recursion) to keep track of nodes.

# BFS ALGORITHM

---

- 1. Start from the source node.
- 2. Add it to the queue.
- 3. Remove the front node, visit its adjacent nodes, and add unvisited nodes to the queue.
- 4. Repeat until the queue is empty.

# DFS ALGORITHM

---

- 1. Start from the source node.
- 2. Mark the node as visited.
- 3. Visit an adjacent unvisited node and repeat the process.
- 4. If no adjacent unvisited node exists, backtrack.
- 5. Repeat until all nodes are visited.



# DIFFERENCES BETWEEN BFS AND DFS

---

- BFS uses a queue, while DFS uses a stack (or recursion).
- BFS explores neighbors first; DFS explores depth-first.
- BFS is better for shortest path; DFS is better for topological sorting.
- BFS requires more memory; DFS is more memory efficient.



# APPLICATIONS OF BFS & DFS

---

- BFS: Finding shortest paths, web crawling, AI (chatbots, recommendation systems).
- DFS: Solving mazes, cycle detection, topological sorting in DAGs.



# CONCLUSION

---

- Both BFS and DFS have their advantages and are used in different scenarios. BFS is preferred when the shortest path is needed, while DFS is useful for problems requiring exhaustive exploration.

Thank You

