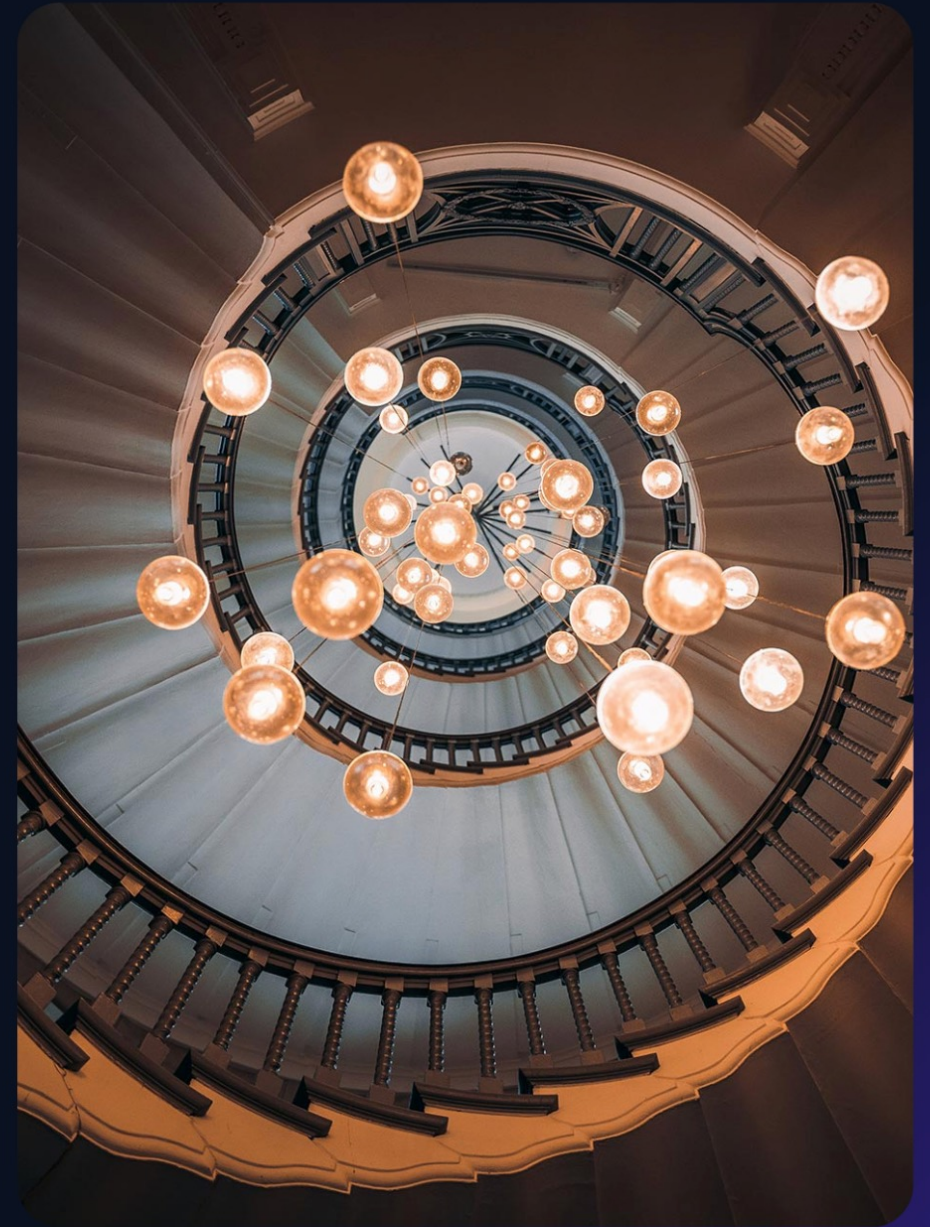


Exploring DFS vs BFS Algorithms

A Comparative Analysis

SE.AbdullahYasin



DFS Algorithm

Explores as far as possible along each branch before backtracking.



BFS Algorithm

Explores all neighbor nodes at the present depth before moving on to nodes at the next depth.



Algorithm Comparison

Understanding DFS and BFS Algorithms

Diving into the Differences Between DFS and BFS

Depth-First Search (DFS) Key Characteristics

Exploring the Essential Features of Depth-First Search



LIFO Approach

Utilizes Last In First Out method for traversal

Recursive Implementation

Executes through recursive function calls

Memory Efficiency with Cycle Risk

Efficient memory usage but susceptible to getting stuck in cycles

Understanding Breadth-First Search (BFS)

Exploring Key Characteristics of BFS Algorithm



FIFO Approach

Follows First In First Out order for traversal



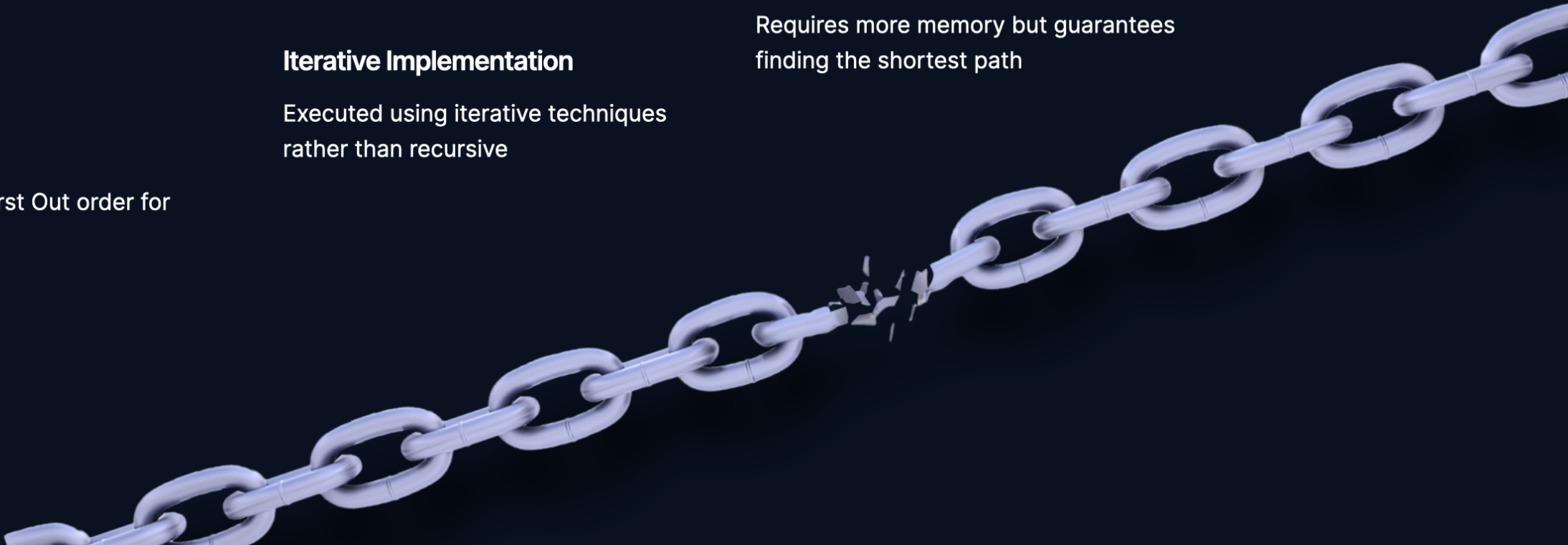
Iterative Implementation

Executed using iterative techniques rather than recursive



Memory Usage

Requires more memory but guarantees finding the shortest path



Time Complexity Comparison: DFS vs BFS

Analyzing Time Complexity of DFS and BFS Algorithms

| Algorithm | Time Complexity (Big O Notation) |
|-----------|----------------------------------|
| DFS | $O(V + E)$ |
| BFS | $O(V + E)$ |

Space Complexity Comparison of DFS and BFS

Analyzing the space complexity with $O(V)$ for DFS and BFS

| DFS | BFS |
|------------------|-----------------------------------|
| Space Complexity | $O(V)$ |
| Memory Usage | DFS: Less, BFS: More due to queue |

Algorithm Comparison

DFS vs BFS: A Comparative Analysis

Exploring the Contrasts between Depth-First
Search and Breadth-First Search



Topological Sorting

Optimal for sorting nodes based on dependencies



Finding Connected Components

Efficiently locates groups of connected nodes



Solving Puzzles like Mazes

Effective in navigation and pathfinding scenarios

Algorithm Applications

Practical Applications of Breadth-First Search (BFS)

Key Practical Uses Where BFS Excels



Shortest Path Finding

Efficiently finds the shortest path between two nodes



Minimum Spanning Tree

Constructs a minimum spanning tree for network optimization



Web Crawlers

Used in web crawling algorithms to systematically explore web pages

Algorithm Selection Considera...

Deciding Between Depth- First Search (DFS) and Breadth-First Search (BFS)

Key Factors to Consider When
Selecting the Right Algorithm

For Finding a Path

BFS is the Preferred Algorithm

For Visiting All Nodes

DFS Might Offer Better Performance

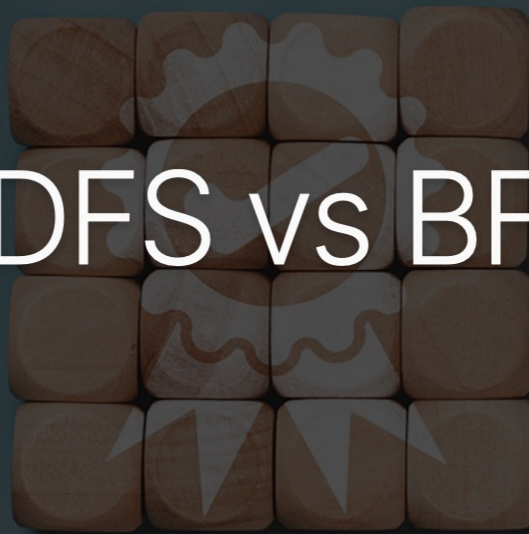
Memory Constraints

Memory Usage Can Influence the Algorithm Choice



Choose Wisely: DFS vs BFS

Exploring the depths of algorithms



Algorithm Comparison

Comparing DFS vs BFS

Key Differences and Applications



DFS

Depth-First Search

Traverses as far as possible along each branch before backtracking.



BFS

Breadth-First Search

Explores all the neighbor nodes at the present depth prior to moving to the nodes at the next depth level.

Thanks !

Do you have any questions

