GLOW LOGICS
SOLUTIONS

MSME
MICRO, SMALL & MEDIUM ENTERPRISES
सूक्ष्म, लघु एवं मध्यम उद्यम
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Ministry of MSME, Govt. of India

AICTE
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All India Council for Technical Education

DSA IN JAVA

BROCHURE

About Glowlogics

At Glowlogics, we are more than just a training platform we are a community of innovators in education. Our program equips you with the knowledge and skills to protect critical systems and networks in today's ever-evolving cyber landscape.

Course Overview

Master the essential concepts of Data Structures and Algorithms (DSA) in one of the most versatile and widely-used programming languages, Java. Whether you're preparing for coding interviews, aiming to improve your problem-solving skills, or just want to dive deeper into Java programming, this course is designed for you!

What is DSA in Java?

Data Structures and Algorithms (DSA) form the foundation of computer science and software development. DSA in Java is a combination of two crucial concepts:

1. **Data Structures:** These are ways to organize and store data efficiently. Common data structures include arrays, linked lists, stacks, queues, trees, graphs, hash tables, and more.
2. **Algorithms:** These are step-by-step procedures or formulas for solving problems. Examples include searching, sorting, and other complex operations on data structures.

What You Will Learn:

1. Introduction to Java

- Java basics, syntax, and control structures.
- Object-Oriented Programming (OOP) concepts.
- Arrays and Strings

2. Array manipulation techniques.

- Strings and string operations.
- Multi-dimensional arrays.
- Linked Lists

3. Singly, doubly, and circular linked lists.

- Implementation and operations (insertion, deletion, traversal).
- Stacks and Queues

4. Stack operations using arrays and linked lists.

- Queue and priority queue implementation.
- Circular queues and dequeues.
- Hashing

5. Hash tables and hash functions.

- Open addressing and chaining techniques.
- Collision resolution.
- Trees

6. Binary trees, binary search trees, and balanced trees.

- Tree traversals (preorder, inorder, postorder).
- Advanced trees: AVL, red-black trees, B-trees.
- Heaps

7. Binary heaps and heap operations.

- Priority queues using heaps.
- Heapify algorithm and its applications
- Graphs

8. Graph representation (adjacency list, matrix).

- BFS (Breadth-First Search), DFS (Depth-First Search).
- Shortest path algorithms (Dijkstra, Bellman-Ford).
- Dynamic Programming

9. Understanding recursion and memoization.

- Common dynamic programming problems (Knapsack, LCS, etc.).
- Sorting and Searching Algorithms

10. Classic sorting techniques: Quick sort, Merge sort, Heap sort, Bubble sort.

- Binary search and other efficient searching methods.
- Greedy Algorithms

11. Greedy approach and optimization problems.

- Common greedy algorithms (Huffman coding, Kruskal's algorithm).
- Backtracking

12. Solving constraint satisfaction problems using backtracking.

- N-queens problem, maze problems.
- Divide and Conquer

13. Recursion and divide-and-conquer strategy.

- Common algorithms like Merge sort, Quick sort.
- Interview Problem Solving

Sample Projects

- **Implementation of a Custom HashMap**
- **Shortest Path Algorithm Using Dijkstra's Algorithm**
- **Designing a Binary Search Tree (BST)**
- **Graph Traversal: Depth-First Search (DFS) and Breadth-First Search (BFS)**
- **Implementing a Priority Queue with a Heap**
- **Balanced Brackets Validator Using Stacks**
- **Job Scheduling Algorithm Using Greedy Approach**

These are sample projects only. Unique capstone projects will be discussed in the live class

Career Opportunities

Upon completing the DSA in java Certification Program, students will be equipped for roles such as:

- **Software Engineer**
- **Backend Developer**
- **Algorithm Specialist**
- **Data Engineer**
- **Full Stack Developer**
- **Machine Learning Engineer**

Certificates

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