JAVA and DSA

>>Here are all the topics below<<

Java Topics:

1. **Introduction to Java**
    - **Basics of Java**
    - **Setting up Java Development Environment**
2. **Java Syntax and Structure**
    - **Variables and Data Types**
    - **Operators**
    - **Control Flow Statements**
    - **Loops**
    - **Functions/Methods**
3. **Object-Oriented Programming (OOP) in Java**
    - **Classes and Objects**
    - **Inheritance**
    - **Polymorphism**
    - **Encapsulation**
    - **Abstraction**
4. **Exception Handling**
    - **Try, Catch, Finally**
    - **Custom Exceptions**
5. **Collections Framework**
    - **Lists, Sets, Maps**
    - **Iterators**

- **Collections API**

6. **Input/Output in Java**
    - **File Handling**
    - **Streams**
7. **Multithreading and Concurrency**
    - **Threads**
    - **Synchronization**
    - **Concurrent Collections**
8. **Java GUI (Swing/AWT)**
    - **Creating Graphical User Interfaces**
9. **Networking in Java**
    - **Sockets**
    - **URL handling**
10. **Database Connectivity (JDBC)**
    - **Connecting to Databases**
    - **Executing SQL queries**
11. **JavaFX (optional)**
    - **Building Java GUI Applications with JavaFX**

Data Structures and Algorithms (DSA) Topics:

1. **Introduction to Data Structures and Algorithms**
    - **Basic Definitions**
    - **Time and Space Complexity**
2. **Arrays**
    - **Basic Operations**
    - **Searching and Sorting**
3. **Linked Lists**

- **Singly Linked Lists**
- **Doubly Linked Lists**
- **Circular Linked Lists**

4. **Stacks and Queues**
    - **Implementations and Applications**
5. **Trees**
    - **Binary Trees**
    - **Binary Search Trees (BST)**
    - **AVL Trees**
    - **Tree Traversals**
6. **Graphs**
    - **Graph Representations**
    - **Breadth-First Search (BFS)**
    - **Depth-First Search (DFS)**
7. **Hashing**
    - **Hash Functions**
    - **Collision Resolution**
8. **Heaps**
    - **Min Heap and Max Heap**
    - **Heap Operations**
9. **Sorting Algorithms**
    - **Bubble Sort, Selection Sort, Insertion Sort**
    - **Merge Sort, Quick Sort**
    - **Radix Sort (optional)**
10. **Searching Algorithms**
    - **Linear Search**

- **Binary Search**
- **Hash-based Searching**

11.Dynamic Programming

- **Memoization**
- **Tabulation**
- **Examples: Fibonacci, Longest Common Subsequence**

12.Greedy Algorithms

- **Concepts and Examples**

13.Graph Algorithms

- **Dijkstra's Algorithm**
- **Kruskal's Algorithm**
- **Topological Sorting**

14.String Algorithms

- **Pattern Matching**
- **Longest Common Substring**

15.Advanced Data Structures (Trie, Segment Tree, Fenwick Tree, etc.)

16.Complexity Analysis

- **Big O Notation**
- **Time and Space Complexity Analysis**