

1. Introduction to Java

- History and Features of Java
- Java Development Kit (JDK), Java Runtime Environment (JRE), and Java Virtual Machine (JVM)
- Setting up the Java Environment (Installation, PATH setup)

2. Java Basics

- Structure of a Java Program
- Syntax and Keywords
- Data Types, Variables, and Constants
- Operators (Arithmetic, Relational, Logical, Bitwise)
- Control Flow Statements (if-else, switch, loops)

3. Object-Oriented Programming (OOP) Concepts

- Classes and Objects
- Constructors
- Inheritance (Single, Multilevel, Hierarchical)
- Polymorphism (Compile-time and Runtime)
- Abstraction (Abstract Classes and Interfaces)
- Encapsulation

4. Java Language Features

- Packages and Access Modifiers
- Static and Non-Static Members
- Nested and Anonymous Classes
- Overloading and Overriding

5. String Handling

- String Class and StringBuffer/StringBuilder
- String Manipulation and Methods
- Regular Expressions

6. Arrays and Collections

- Single and Multidimensional Arrays
- Introduction to Collection Framework
- List, Set, Map, and their Implementations (ArrayList, HashSet, HashMap, etc.)
- Iterators and Stream API

7. Exception Handling

- Types of Exceptions
- try-catch-finally Blocks
- throw, throws, and Custom Exceptions

8. Multithreading

- Thread Class and Runnable Interface
- Lifecycle of a Thread
- Synchronization and Inter-Thread Communication
- Thread Priorities and Daemon Threads

9. File Handling

- File Input/Output Streams
- Reading and Writing Files
- Serialization and Deserialization

10. Java Input/Output

- Byte Stream and Character Stream
- BufferedReader and BufferedWriter
- Scanner Class