



Fundamental Java Training with AI Tools

Course Duration: 2 Months • Class Time: 1.5 Hrs

1. Introduction

- Java platform, history and features
- Java PC set up, about JDK/JRE/JVM
- Setting up IDEs - IntelliJ, STS/Eclipse, VS Code
- Environment variable and command interface
- Introduction to AI tools in coding:
 - Using ChatGPT for coding help
 - Using GitHub Copilot for code suggestions
 - Leveraging AI-powered debugging & optimization tools
- Compiling and Running first Hello World Program

2. Syntax & Grammar

- Lexical Structure
- Naming Conventions
- Comments and Formatting
- Command Line Arguments
- Data Types and Variables
- Literal Constants
- Operators and Expressions

3. Data Types

- Why data types
- Different types of data type:
 - Primitive data types
 - Non-primitive types

4. Control Statements

- Conditions, Statements, Blocks
- Conditional Statements
- Loops and Switches
- Continue, Break and Return
- Array and Arrays class
- Enum Types and its application

5. String

- String Class and its Methods
- StringBuffer Class
- StringBuilder Class
- String Tokenizers
- String Applications

6. Array

- Introduction, Advantage and Dis-Advantages of Array
- Array declaration, instantiation and initialization
- Types of Arrays (One Dimensional and Multi-Dimensional Array)
- Passing array in to method.
- Some in-build methods of Arrays

7. Methods

- Benefits of using methods
- Syntax of Methods
- Declaration, implementation and calling methods
- Method Types
- Parameters and Return types

8. Class Libraries

- Type Wrappers
- System Class & Math Class
- NumberFormat Class
- DecimalFormat Class
- BigInteger, BigDecimal class
- Package and import
- Access modifiers and their uses

Object Oriented Programming with Java (OOP)

9. Class, Object and Encapsulation

- Class and Objects
- Constructor and Encapsulation
- Properties and Methods
- Relationship between classes
- Static keyword and its uses
- Static block
- This keyword and its uses

10. Inheritance & Polymorphism

- Inheritance
- Type of Inheritance in Java
- Method overloading/overriding
- Super keyword and its uses
- Final variable/method/class
- Polymorphism: Static/Dynamic Binding

11. Abstraction

- Abstract class and methods
- Interface

12. Java Collection Framework

- Collections and Mappings
- Utilities and Algorithms
- List, Set and Map uses
- Collections and Arrays class
- Functional interfaces
- Lambda Expressions
- Streams

13. File Handling

- File Management
- File Streams
- Data Streams
- Stream Tokenization
- Random Access Files

14. JDBC

- Introduction and JDBC Architecture
- JDBC Driver and its types (MySQL, Oracle)
- Features of JDBC
- Accessing Database using Java and JDBC
- Enhanced SQL Exception Handling
- Relational Database Concepts
- Understanding Common SQL Statements

15. Swing Framework (GUI Design)

- Containers, Windows, Panes
- JFrame and JPanel
- Dialog Boxes
- Labels, Icons and Buttons
- Basic Event Listeners
- Bounded-Range Components
- Checkboxes
- Radio Buttons
- Lists, ComboBoxes, Spinners
- Text and Password Fields
- TextAreas and JTable
- Colors and Fonts
- Borders and Separators
- Component Sizing
- Layout Managers

16. Projects

1. Console base Applications:
 - a. Book Management System (BMS)
 - b. Product Management System (PMS)
2. UI/GUI base Application (using Swing and JDBC):
 - a. Inventory System for Shopping Mart





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