



# TRAINING TRAINS

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IT Services and IT Consultancy \ Internship-Inplant Training \ Software Training Institute

உங்கள் கடை மற்றும் வியாபாரத்திற்கு ஏற்ற **Website & Andriod App** மற்றும் **Software** மிகச்சிறந்த முறையில் செய்து கொடுக்கப்படும்.

Expertise : **AI, Machine Learning & Data Science \ Cybersecurity & Ethical Hacking**  
**IoT, Blockchain & Cloud Computing \ Full Stack Web & Mobile Development**  
**Digital Marketing & SEO**

**W3 App Developers**

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## Java Developer – 100+ Lab Exercises (Basic, Intermediate, Advanced)

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### Basic Level (30+ Exercises)

#### Java Fundamentals

- Set up Java SDK and IDE (Eclipse/IntelliJ).
- Write your first Java program – "Hello World".
- Lab: Variables and Data Types – create a student info system.
- Lab: Type casting and type conversion examples.
- Lab: Arithmetic operations and precedence.

#### Control Structures & Loops

- Lab: Even/Odd Number Checker using `if/else`.
- Lab: Switch-case grade evaluator.
- Lab: Multiplication table using `for` loop.
- Lab: Prime number checker using `while`.
- Lab: Pattern printing using nested loops (pyramids, diamonds).

#### Arrays & Strings

- Lab: Reverse an array.
- Lab: Search and sort arrays.
- Lab: Palindrome checker using strings.
- Lab: Count vowels, consonants in a string.
- Lab: Anagram checker.

#### Object-Oriented Programming

- Lab: Create a `Car` class with fields and methods.
- Lab: Constructor overloading.
- Lab: Inheritance example: `Animal` -> `Dog`.
- Lab: Method overriding.
- Lab: Abstraction with abstract classes.



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## Intermediate Level (40+ Exercises)

### Advanced OOP

- Lab: Interface implementation – Shape interface.
- Lab: Polymorphism using base and derived classes.
- Lab: Use `this` and `super` keywords.
- Lab: Singleton pattern implementation.
- Lab: Use `final`, `static`, `enum`.

### Exception Handling

- Lab: Try-catch-finally example.
- Lab: Custom exception creation and handling.
- Lab: Multiple exception handling.

### Collections & Generics

- Lab: Create and sort a `List` of objects.
- Lab: `HashMap` usage – phone directory.
- Lab: `Set` operations – unique values.
- Lab: Generic class and method implementation.

### Multithreading

- Lab: Extend `Thread` class and implement `Runnable`.
- Lab: Thread synchronization example.
- Lab: Producer-Consumer problem with `wait/notify`.

### File I/O & Serialization

- Lab: Read and write a text file.
- Lab: Serialize and deserialize an object.
- Lab: Directory traversal utility.

## Advanced Level (40+ Exercises)



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## ☐ JDBC & Database Connectivity

- Lab: Connect Java with MySQL.
- Lab: CRUD operations using JDBC.
- Lab: PreparedStatement usage.
- Lab: Transaction management.

## ☐ Java Networking

- Lab: Client-Server communication using Sockets.
- Lab: Build a simple chat application.
- Lab: URL and HttpURLConnection usage.

## ☐ Java Collections Deep Dive

- Lab: Implement a custom comparator.
- Lab: PriorityQueue usage for task scheduling.
- Lab: ConcurrentHashMap example.
- Lab: LinkedList vs ArrayList benchmark.

## ☐ Design Patterns

- Lab: Factory pattern for object creation.
- Lab: Observer pattern for event notification.
- Lab: Decorator pattern to enhance functionality.
- Lab: Strategy pattern for dynamic behavior change.

## ☐ Web Development with Servlets & JSP

- Lab: Setup Apache Tomcat and create a servlet.
- Lab: Form handling using servlet + JSP.
- Lab: Session tracking using HttpSession.
- Lab: Servlet filter and listener implementation.

## ☐ Spring Framework (Intro)

- Lab: Spring Boot Hello World App.
- Lab: RESTful API using Spring Boot.
- Lab: Spring Data JPA with MySQL.
- Lab: Spring Security login example.



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## □ Capstone Projects

- **Library Management System** (Swing + JDBC)
- **Online Food Ordering App** (Servlet + JSP + MySQL)
- **E-Commerce REST API** (Spring Boot + JPA + JWT)
- **Chat Application** (Socket Programming + Threads)
- **Banking System Simulation** (OOP + Collections + I/O)

## □ Tools & Environment

- **Languages:** Java SE 8/11/17
- **Frameworks:** Spring Boot, Hibernate
- **Databases:** MySQL, PostgreSQL
- **IDEs:** IntelliJ, Eclipse
- **Build Tools:** Maven, Gradle
- **Testing:** JUnit, Mockito
- **Version Control:** Git & GitHub