Faysal Aziz

Java & Microservices

A 4-day comprehensive course

FA-0268 · 4-day

Software Development

Introduction

Welcome to our 4-Day Java with Microservices Training Course, a comprehensive program designed to introduce you to the world of Java programming and the modern approach to building scalable and resilient applications using microservices.

Java is one of the most popular and widely used programming languages in the world, known for its portability, security, and robustness. Combined with the architectural style of microservices, Java enables developers to create efficient, scalable applications that can easily adapt to changing business requirements.

This course is perfect for aspiring developers and IT professionals looking to enhance their programming skills and understanding of modern application development.

Learning outcomes

Upon completing this course, you will be able to:

- Understand the basics of Java programming, including syntax, control structures, and object-oriented principles.
- Develop and debug Java applications using development tools and IDEs.
- Understand the principles of microservices architecture and its advantages over monolithic architecture.
- Design and implement microservices using Java and Spring Boot.
- Secure, deploy, and manage microservices.
- Utilize microservices communication mechanisms, including RESTful services and event-driven architecture.

Prerequisites

- Basic understanding of programming concepts.
- Familiarity with web development fundamentals.
- Access to a computer with an internet connection, capable of running Java and related development tools.

Training outline

1. Introduction to Java Programming

Java Overview

1. History and Features of Java
2. Java Runtime Environment (JRE) and Java Development Kit (JDK)

Setting Up the Java Development Environment

1. Installing Java and IDE setup (Eclipse/IntelliJ IDEA)

Java Basic Concepts

1. Data Types and Variables
2. Operators and Expressions
3. Control Flow Statements (if-else, switch, loops)

Object-Oriented Programming (OOP) in Java

1. Classes and Objects
2. Constructors and Methods
3. Inheritance, Polymorphism, Abstraction, and Encapsulation

Collections and Generics

1. Arrays and ArrayLists
2. HashMaps and Sets
3. Using Generic Types

Exception Handling and Debugging

1. Try-catch Blocks
2. Creating Custom Exceptions
3. Debugging Techniques with IDE

2. Advanced Java Concepts

1. File I/O and Serialization

2. Multithreading and Concurrency
3. Networking in Java
4. Java Database Connectivity (JDBC)

3. Introduction to Microservices

Microservices Architecture Overview

1. Principles of Microservices
2. Advantages and Challenges

2. Transitioning from Monolithic to Microservices

Designing Microservices

1. Domain-Driven Design
2. Bounded Contexts and Service Decomposition

4. Building Microservices with Java and Spring Boot

Spring Boot Basics

1. Overview of Spring Boot
2. Setting Up a Spring Boot Project
3. Understanding Auto-configuration

Developing Your First Microservice

1. Creating RESTful Web Services
2. Accessing Data with Spring Data JPA

Microservices Communication

1. Synchronous vs. Asynchronous
2. RESTful Services and API Gateway
3. Event-Driven Architecture with Messaging (RabbitMQ/Kafka)

Security in Microservices

1. Authentication and Authorization
2. Securing Microservice APIs with JWT

Testing Microservices

1. Unit Testing with JUnit
2. Integration Testing Strategies

Deployment and Monitoring

1. Containerization with Docker
2. Microservices Deployment with Docker and Kubernetes

3. Monitoring and Health Checks

5. Best Practices and Patterns in Microservices

1. Microservices Design Patterns
2. Configuration Management
3. Service Discovery
4. Resilience and Fault Tolerance (Circuit Breaker pattern)
5. Observability and Log Management

This 4-day course is designed to provide a blend of theoretical knowledge and practical exercises, enabling participants to not only understand Java and microservices concepts but also apply them in real-world projects.

By the end of this course, participants will have a solid foundation in Java programming and the skills to design and implement scalable and resilient applications using the microservices architecture.

Please do note that the training will follow an agile methodology. As such the sequence of topics covered may not necessarily follow the structure of the outline.

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