2024 - Java / Design patterns + TDD / QA

Document status	REVIEWED
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Delivered by	Vinsys
Theme	Build Architecture
Sub theme	Local development Microservices architecture
Module	Java / Design patterns TDD / QA
Duration	4 days

Pre-requisites

N/A

Learning Objectives

Upon completion of this module, the participant will be able to:

- Understand basics of Java coding, debugging and code optimization
- Understand the Java coding best practices
- Understand SOLID principles
- Understand some of the key creational, structural and behavioral patterns as defined by GoF book
- Understand how the patterns are implemented in core Java libraries
- Expanding from Microservices to APIs

- Gain an understanding of the Microservices architecture and pros/cons of this architecture approach
- Gain an understanding of Monolith versus Microservices versus Serverless architecture styles
- Understand common design patterns used in Microservices development
- Understand some of the popular tools and frameworks in use for Microservices development

- High level approach to Testing and Software Quality
- Rationale of developer writing test cases
- TDD: Process and its pitfall
- Basic understanding of other practices like BDD and how it differed from TDD
- Testing Framework (Mockito, Wiremock, etc.)

- What is QA ?
- What is Software Testing? Definition, Basics & Types
- Basic of MTS (Minimum Testing Standards)

Topics

Day 1 (1st half)

- Java evolution
- where is Java good to use
- where not to use Java
- Core libraries (io, database, collections, streams, logging, functions, annotations, lambdas)
- Data structures
- Functional programming
- Spring frameworks
- Java 8 Features

Day 2

- **Concurrency**
- **Messaging**
- Java Debugging
- Program Documentation
- Auto formatting
- **Sonar**
- Software quality and basic of Unit testing
    - Definition of Unit and technique to test Unit in isolation.
    - Example of testing simple math like units
    - Introduce JUnit framework and basic hands on examples.
    - BDD Orientation

Day 3

- GoF patterns - Creational, Structural, Behavioral
- Design Principles
- Java Do's and Don'ts/ best practices -> checklist is at https://mydb.intranet.db.com/docs/DOC-514588

Day 4

Introduction to Microservices

- Understanding the Monolith application and its challenges
- What are Microservices
- Basic building blocks of Microservices
- How do Microservices solve the challenges with Monolith?

Microservices in action

- How to build, deploy and test Microservices
- Common design patterns for creating Microservices
- REST and JSON
- Popular frameworks in use
- Key benefits
- Key challenges
- Monitoring/Alerting

Pre-reading, Resources, Hands-on sessions / exercises

- 2024 - Java / Design patterns + TDD / QA
- Execute Full GC for JVM instance via JMX
- How to update Java on DAP instance tc0322
- How to update Java on DAP instance tc0235
- How to update Java on SMMP

Assignments and Evaluations (optional)

N/A