SALIENT TECH SOLUTIONS'

JAVA DEVELOPER

Week 1: Core Java Mastery & OOP Foundations (Java 8, 11, 17)

Day 1: JVM & IDE Setup

- Understand JVM, JDK versions (8, 11, 17+), differences
- Install and configure IntelliJ IDEA or Eclipse
- Project: Create a basic Java project structure in IDE

Day 2: Java Language Basics I

- Variables, Data Types, Operators, Control Structures
- Arrays
- Project: Write a CLI calculator and basic array operations

Day 3: Java Language Basics II

- Strings, StringBuilder, StringBuffer
- Methods and Recursion
- Project: Implement string manipulation utilities with recursion support

Day 4: Advanced OOP Concepts I

- Classes, Objects, Constructors
- Inheritance, Polymorphism
- Project: Model User and Admin classes with inheritance and constructors

Day 5: Advanced OOP Concepts II + Java 8+ Features Intro

- Encapsulation, Abstraction, Access Modifiers
- Java 8: Lambdas, Functional Interfaces
- Project: Enhance classes with encapsulation, and use lambdas for filtering user input

Week 2: Design Patterns, Advanced Java & Debugging

Day 6: Design Principles & Singleton Pattern

- SOLID, DRY, KISS, YAGNI principles
- Singleton Pattern implementation
- Project: Apply Singleton pattern to a ConfigurationManager class

Day 7: Factory & Builder Pattern

- Factory Design Pattern
- Builder Pattern
- Project: Refactor object creation with Factory/Builder pattern

Day 8: Exception Handling & Custom Exceptions

- try-catch-finally, throw, Custom Exceptions
- Project: Add error handling with custom exceptions (e.g., InvalidLoginException)

Day 9: Debugging Techniques & Logging

- IDE Debugger: breakpoints, watches, stack traces
- Intro to Log4j2 / SLF4J
- Project: Replace print statements with Log4j2 and simulate common bugs

Day 10: Generics & Collections Deep Dive

- Generics: bounded types, wildcards
- Collections: Lists, Maps, Sets, Queue, Big-O Analysis
- Project: Create a generic in-memory repository with performance notes

Week 3: Multithreading, Concurrency, and Collections Framework

Day 11: Thread Lifecycle & Runnable vs Thread

- Thread Class vs Runnable Interface
- Lifecycle: NEW, RUNNABLE, BLOCKED, WAITING, TIMED_WAITING, TERMINATED
- Project: Simulate a thread-based timer/task scheduler

Day 12: Executor Framework & ThreadPoolExecutor

- ExecutorService, ThreadPoolExecutor, Callable & Future
- Project: Create multithreaded service request handler using thread pools

Day 13: Synchronization & Concurrency Tools

- wait(), notify(), notifyAll(), synchronized blocks
- Locks, Atomic Variables
- Project: Add thread-safe methods using synchronization and Concurrent Collections

Day 14: Java Memory Model & Collections Recap

- JMM, Volatile, Atomic Variables
- Thread-safe collections: ConcurrentHashMap, CopyOnWriteArrayList
- Project: Build a service request history manager with concurrency in mind

Day 15: Parallel Streams & Project Refactor

- Streams deep dive: map, filter, reduce, parallel streams
- Project: Refactor data processing to use Streams API with performance test

Week 4: File I/O, JDBC, Hibernate ORM & NoSQL

Day 16: File I/O & Serialization

- FileReader/Writer, BufferedReader/Writer
- Object Serialization/Deserialization
- Project: Add file-based persistence for backup/export of user data

Day 17: JDBC with MySQL/PostgreSQL

- Setup DB, JDBC CRUD, Transactions, Batch
- PreparedStatement, HikariCP
- Project: Implement JDBC layer for User and Service entities

Day 18: Hibernate ORM Basics

- Entity mapping, annotations, OneToOne, OneToMany
- JPQL and Criteria API
- Project: Replace JDBC with Hibernate for entity persistence

Day 19: Spring Data JPA & MongoDB Intro

- Spring Data JPA setup and repositories
- MongoDB: collections, CRUD, Spring Data MongoDB
- Project: Add service logs to MongoDB using Spring Data Mongo

Day 20: DB Optimization & Transactions

- Indexes, Caching (Ehcache), Query Optimization
- Project: Optimize queries and wrap service booking in transaction

Week 5: RESTful APIs, Spring Boot, Security & OpenAPI

Day 21: Spring Boot Basics

- IoC, DI, Annotations, Controllers
- Project: Convert console app to Spring Boot REST service

Day 22: REST Endpoints & Validation

- Spring MVC, request/response lifecycle, validation
- Project: Add endpoints for user registration/login with validation

Day 23: Spring Security & JWT Authentication

- Authentication, Authorization, JWT, RBAC
- Project: Secure endpoints with JWT and Spring Security roles

Day 24: OpenAPI & API Documentation

- Swagger/OpenAPI 3 integration
- Project: Add API docs and test endpoints in Swagger UI/Postman

Day 25: Logging, Monitoring & Deployment Prep

- Spring Actuator, Micrometer basics
- Project: Add monitoring endpoints and finalize API layer for GitHub push

Week 6: Microservices, Docker, CI/CD, System Design

Day 26: Microservices Principles & Spring Boot Setup

- Microservices basics, loose coupling, Eureka (optional)
- Project: Break monolith into User, Service Request, Admin services

Day 27: Inter-Service Communication & Resilience4j

- REST, FeignClient, Circuit Breakers
- Project: Implement FeignClient for internal service calls

Day 28: Docker & Local Orchestration

- Dockerize apps, Docker Compose for local orchestration
- Project: Create Dockerfiles, Docker Compose setup

Day 29: Unit/Integration Testing & CI/CD

- JUnit 5, Mockito, MockMVC, GitHub Actions/Jenkins
- Project: Add test cases and CI pipeline

Day 30: Deployment & Final System Design

- Deploy to AWS ECS / Azure, HLD/LLD
- Load Balancing, Rate Limiting
- Project: Deploy, finalize System Design Document and present on GitHub