

SPRING BOOT & MICRO SERVICES COURSE CONTENT

SPRING BOOT

- 1) What is Spring Framework
- 2) What is Spring Boot
- 3) Differences between Spring & Spring Boot
- 4) Spring Boot Overview
- 5) Pros & Cons of Spring Boot
- 6) Approaches to create Spring Boot Application
 - a) Spring Initializer (start.spring.io)
 - b) Spring Starter Wizard in STS IDE
- 7) Introduction to Spring Boot Starters
 - a) Spring Boot Parent Starter
 - b) Spring-boot-starter
 - c) Spring-boot-starter-web
 - d) Spring-boot-starter-webflux
 - e) Spring-boot-starter-data-jpa
 - f) Spring-boot-devtools
 - g) Spring-boot-starter-mail
 - h) Spring-boot-actuator
 - i) Spring-boot-starter-test etc.
- 8) What is Start Class in Spring Boot
- 9) @SpringBootApplication annotation internals
- 10) SpringApplication.run(..) method internals
- 11) Spring Boot Application Boot strapping
- 12) AutoConfiguration in Spring Boot
- 13) IOC container
- 14) Dependency Injection
 - a) Setter Injection
 - b) Constructor Injection
 - c) Field Injection
- 15) Stereotype Annotations
 - a) @Component
 - b) @Service
 - c) @Repository
 - d) @Controller
- 16) Base Package Naming convention
- 17) Component Scanning
- 18) Auto wiring
 - a) byType

- b) byname
- c) constructor
- d) none

- 19) @Qualifier annotation
- 20) @Primary annotation
- 21) Introduction to @Configuration annotation
- 22) Details of @Bean annotation
- 23) Bean Life Cycle
- 24) Bean Scopes
- 25) Banner in Spring Boot
- 26) Standalone application development in Spring Boot
- 27) Standalone application with layered architecture
- 28) Runner in Spring Boot
 - a) Application Runner
 - b) CommandLine Runner

SPRING DATA JPA

- 1) What is Persistence Layer
- 2) Best practises to follow in persistence layer
- 3) ORM Basics
- 4) Spring Data JPA Introduction
- 5) Differences between Spring ORM and Spring Data
- 6) CrudRepository introduction
- 7) CrudRepository methods for DB operations
 - a) save() method
 - b) saveAll() method
 - c) findById() method
 - d) findAllById() method
 - e) findAll() method
 - f) deleteById() method
 - g) deleteAllById() method
 - h) delete() method
 - i) count()
 - j) existsById()
- 8) Custom findByXXX method syntax
- 9) Custom Queries Execution in Data JPA

- 10) JpaRepository introduction
- 11) JpaRepository methods for DB operations
- 12) Pagination Using Data JPA methods
- 13) Sorting Using Data JPA Methods
- 14) Query By Example Executor
- 15) Generators
- 16) Custom Generators in Spring Data
- 17) Embedded Database Introduction
- 18) Application Development using Embedded Database (H2)
- 19) Application Development Using MYSQL Database
- 20) Application Development Using MongoDB
- 21) Profiles in Spring Boot

SPRING WEB MVC

- 22) Spring Web MVC Introduction
- 23) Spring Web MVC Advantages
- 24) Spring MVC Architecture
- 25) Introduction to Front Controller
- 26) Controllers
- 27) Handler Mappers
- 28) View Resolvers
- 29) Web Application development using Spring Boot
- 30) Embedded HTTP Servers Introduction
 - a) Embedded Tomcat Server
 - b) Embedded Jetty Server
 - c) Embedded Undertow Server
- 31) Making Jetty as Default server
- 32) Web Application Deployment in External Server
- 33) Sending Data From UI to Controller
 - a) Query Param
 - b) Path Param
- 34) Sending Data From Controller to UI
 - a) Model
 - b) ModelAndView
- 35) @RequestBody annotation
- 36) @ResponseBody annotation
- 37) Form Based application development using Spring Boot

- 38) Thymeleaf Introduction
- 39) Web Application with Thymeleaf
- 40) Sending Email using Spring Boot
- 41) Exception Handling in Spring Boot Web Application
- 42) Spring Boot Actuators
 - a) Health
 - b) Info
 - c) Heapdump
 - d) Threaddump
 - e) Beans
 - f) Httptrace
 - g) Mappings
 - h) Shutdown etc
- 43) Unit Testing for Spring Boot Application using Junit with Mocking

SPRING REST

- 44) Distributed Applications
- 45) Distributed Technologies
- 46) SOAP vs REST
- 47) RESTful Services Introduction
- 48) REST principles
- 49) One Time operations
- 50) Run Time Operations
 - a) Marshalling
 - b) Un Marshalling
- 51) JAX-B Introduction
- 52) JAX-B Architecture
- 53) Applications development with JAX-B
- 54) JSON Introduction
- 55) XML vs JSON
- 56) JACKSON API
- 57) Converting Java object to JSON and vice versa using Jackson API
- 58) GSON API
- 59) Converting Java Object to JSON and Vice Versa using GSON API
- 60) HTTP Protocol Details
- 61) HTTP Methods
 - a) GET
 - b) POST
 - c) PUT
 - d) DELETE

- 62) HTTP Status Codes
- 63) @RestController
- 64) @RequestBody
- 65) @ResponseBody
- 66) @RequestParam
- 67) @PathVariable
- 68) MediaTypees
- 69) Consumes
- 70) Produces
- 71) Accept Header
- 72) Content-Type header
- 73) REST API Development using Spring Boot
- 74) POSTMAN
- 75) SWAGGER & SWAGGER UI
- 76) Exception Handling in REST API
- 77) REST Security
 - a) HTTP Basic Auth
 - b) JWT
 - c) OAuth2.0
- 78) Mono Objects
- 79) Flux Objects
- 80) REST Client Introduction
- 81) RestTemplate
- 82) WebClient
- 83) RestTemplate vs WebClient
- 84) Reactive Programming
- 85) Synchronous vs Asynchronous Calls
- 86) Apache Kafka with Spring Boot
- 87) Redis Cache Integration with Spring Boot

MICRO SERVICES

- 88) Monolith Architecture Introduction
- 89) Monolith Architecture case study
- 90) Monolith Application Deployment Process
- 91) Load balancer (Cluster) case study
- 92) Load Balancing Algorithms
 - a) Round Robin
 - b) IP Hashing
 - c) Sticky Session
- 93) Monolith Architecture Drawbacks
- 94) Micro services Introduction
- 95) Micro Services Advantages
- 96) Micro Services Dis-Advantages
- 97) Micro Services case study

- 98) Identifying Micro services boundaries
- 99) Micro services Architecture
- 100) Micro services Development
 - a) API – 1
 - b) API – 2
- 101) Interservice communication case study
- 102) FeignClient
- 103) Cloud Introduction
 - a) AWS
 - b) AZURE
 - c) PCF
- 104) AWS Account Creation
- 105) AWS Services Overview
- 106) Deploying Micro services to AWS
- 107) Auto Scaling
- 108) Service Registry case study (Netflix Eureka)
- 109) API Gateway
- 110) Hystrix (Circuit Breaker)
- 111) Hystrix Dashboard
- 112) Spring Boot Admin Server
- 113) Spring Boot Admin Client
- 114) Distributed Logging
 - a) Sleuth Logging
 - b) Zipkin Server
- 115) Ribbon case study (Micro services load balancer)
- 116) Implementing Ribbon in Micro services
- 117) ConfigServer Introduction & Implementation
- 118) Micro services Integration with Angular

TOOLS

- 119) Maven
- 120) Log4J
- 121) Junit & Mocking
- 122) Jenkins
- 123) Docker
- 124) SonarQube
- 125) POST MAN