

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
 - e) @Indexed

- 16) Base Package Naming convention
- 17) Component Scanning
- 18) Autowiring
 - 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) application.properties file
- 24) application.yml file
- 25) Standalone application development in Spring Boot
- 26) Standalone application with layered architecture
- 27) Runner in Spring Boot
 - a) Application Runner
 - b) CommandLine Runner
- 28) Spring Boot Profiles
- 29) Logging in Spring Boot
 - a) Log4J
 - b) Log4J2
 - c) Logback
 - d) SLF4J



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) Embedded Database vs External Database
- 19) Application Development using Embedded Database (H2)
- 20) Application Development Using MYSQL Database
- 21) Application Development Using PostGreSQL Database
- 22) Application Development Using MongoDB

23) Profiles in Spring Boot

SPRING WEB MVC

- 24) Spring Web MVC Introduction
- 25) Spring Web MVC Advantages
- 26) Spring MVC Architecture
- 27) Introduction to Front Controller
- 28) Controllers
- 29) Handler Mappers
- 30) View Resolvers
- 31) Web Application development using Spring Boot
- 32) Embedded HTTP Servers Introduction
 - a) Embedded Tomcat Server
 - b) Embedded Jetty Server
 - c) Embedded Undertow Server
- 33) Making Jetty as Default server
- 34) Web Application Deployment in External Server
- 35) Sending Data From UI to Controller
 - a) Query Param
 - b) Path Param
- 36) Sending Data From Controller to UI
 - a) Model
 - b) ModelAndView
- 37) @RequestBody annotation
- 38) @ResponseBody annotation
- 39) Introduction to Spring MVC Form Tag library
- 40) Form Based application development using Spring Boot
- 41) Thymeleaf Introduction
- 42) Web Application with Thymeleaf
- 43) Sending Email using Spring Boot
- 44) Exception Handling in Spring Boot Web Application
- 45) Spring Boot Actuators
 - a) Health
 - b) Info
 - c) Heapdump
 - d) Theadddump
 - e) Beans
 - f) Httptrace

- g) Mappings
- h) Shutdown etc

- 46) Unit Testing for Spring Boot Application using Junit with Mocking
- 47) Code Coverage using Jacocco

SPRING REST

- 48) Distributed Applications
- 49) Distributed Technologies
- 50) SOAP vs REST
- 51) RESTful Services Introduction
- 52) REST principles
- 53) XML
- 54) XSD
- 55) One Time operations
- 56) Run Time Operations
 - a) Marshalling
 - b) Un Marshalling
- 57) JAX-B Introduction
- 58) JAX-B Architecture
- 59) Applications development with JAX-B
- 60) JSON Introduction
- 61) XML vs JSON
- 62) JACKSON API
- 63) Converting Java object to JSON and vice versa using Jackson API
- 64) GSON API
- 65) Converting Java Object to JSON and Vice Versa using GSON API
- 66) HTTP Protocol Details
- 67) HTTP Methods
 - a) GET
 - b) POST
 - c) PUT
 - d) DELETE
- 68) HTTP Status Codes
 - a) 1XX
 - b) 2xx
 - c) 3xx
 - d) 4xx
 - e) 5xx
- 69) @RestController

- 70) @RequestBody
- 71) @ResponseBody
- 72) @RequestParam
- 73) @PathVariable
- 74) MediaType
- 75) Consumes
- 76) Produces
- 77) Accept Header
- 78) Content-Type header
- 79) REST API Development using Spring Boot
- 80) POSTMAN
- 81) SWAGGER & SWAGGER UI
- 82) Exception Handling in REST API
- 83) REST Security
 - a) HTTP Basic Auth
 - b) JWT
 - c) OAuth2.0
- 84) Mono Objects
- 85) Flux Objects
- 86) REST Client Introduction
- 87) RestTemplate
- 88) WebClient
- 89) RestTemplate vs WebClient
- 90) Reactive Programming
- 91) Synchronous vs Asynchronous Calls
- 92) Apache Kafka Integration with Spring Boot
- 93) Redis Cache Integration with Spring Boot

MICRO SERVICES

- 94) Monolith Architecture Introduction
- 95) Monolith Architecture case study
- 96) Monolith Application Deployment Process
- 97) Load balancer (Cluster) case study
- 98) Load Balancing Algorithms
 - a) Round Robin
 - b) IP Hashing
 - c) Sticky Session
- 99) Monolith Architecture Drawbacks
- 100) Micro services Introduction
- 101) Micro Services Advantages

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

TOOLS

- 125) Maven
- 126) Log4J
- 127) Junit & Mocking
- 128) Jenkins
- 129) Docker
- 130) SonarQube
- 131) JIRA
- 132) SOAP UI
- 133) POST MAN

