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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**

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5) **Differences between Spring ORM and Spring Data**

6) **CurdRepository introduction**

7) **CurdRepository 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) **Profiles in Spring Boot**

SPRING WEB MVC

21) **Spring Web MVC Introduction**

22) **Spring Web MVC Advantages**

23) **Spring MVC Architecture**

24) **Introduction to Front Controller**

25) **Controllers**

26) **Handler Mappers**

27) **View Resolvers**

28) **Web Application development using Spring Boot**

29) **Embedded HTTP Servers Introduction**
   a) Embedded Tomcat Server
   b) Embedded Jetty Server

30) **Making Jetty as Default server**

31) **Web Application Deployment in External Server**

32) **Sending Data From UI to Controller**
   a) Query Param
   b) Path Param

33) **Sending Data From Controller to UI**
   a) Model
   b) ModelAndView

34) **@RequestBody annotation**

35) **@ResponseBody annotation**

36) **Form Based application development using Spring Boot**

37) **Thymeleaf Introduction**

38) **Web Application with Thymeleaf**

39) **Sending Email using Spring Boot**

40) **Exception Handling in Spring Boot Web Application**

41) **Spring Boot Actuators**
   a) Health
   b) Info
   c) Heapdump
   d) Theaddump
   e) Beans

f) Httptrace
g) Mappings
h) Shutdown etc

SPRING REST

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

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

MICRO SERVICES

86) Monolith Architecture Introduction
87) Monolith Architecture case study
88) Monolith Application Deployment Process
89) Load balancer (Cluster) case study
90) Load Balancing Algorithms
   a) Round Robin
   b) IP Hashing
   c) Sticky Session

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