



# CODING CREATROS.

## 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) 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) Threaddump

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) MediaTypees

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



- 91) Monolith Architecture Drawbacks
- 92) Micro services Introduction
- 93) Micro Services Advantages
- 94) Micro Services Dis-Advantages
- 95) Micro Services case study
- 96) Identifying Micro services boundaries
- 97) Micro services Architecture
- 98) Micro services Development

- a) API – 1
- b) API – 2

- 99) Interservice communication case

Study (FeignClient )

- 100) Cloud Introduction
- 101) AWS Account Creation
- 102) AWS Services Overview
- 103) Deploying Micro services to AWS
- 104) Service Registry case study (Netflix Eureka)
- 105) API Gateway
- 106) Hystrix (Circuit Breaker)
- 107) Spring Boot Admin Server
- 108) Spring Boot Admin Client
- 109) Distributed Logging
  - a) Sleuth Logging
  - b) Zipkin Server
- 110) Ribbon case study (Micro services load balancer)
- 111) Implementing Ribbon in Micro services
- 112) ConfigServer Introduction & Implementation
- 113) Micro services Integration with Angular

## **TOOLS**

- 114) Maven
- 115) Log4J
- 116) Junit 5
- 117) Jenkins Deployment
- 118) Docker
- 119) POSTMAN
- 120) Swagger