

SPRING FRAMEWORK – COMPLETE CONTENTS

1. INTRODUCTION TO SPRING

- What is Spring Framework
 - Problems with traditional Java (JDBC, Servlets)
 - Spring architecture overview
 - Spring modules
 - Advantages of Spring
 - Spring vs Spring Boot
-

2. SPRING CORE (IoC & DI) ★

Inversion of Control (IoC)

- What is IoC
- IoC container
- BeanFactory vs ApplicationContext

Dependency Injection (DI)

- Constructor Injection
- Setter Injection
- Field Injection
- @Autowired
- @Qualifier
- @Primary

Spring Beans

- What is a Bean
 - Bean lifecycle
 - Bean scopes
 - Singleton
 - Prototype
 - Request
 - session
 - init-method & destroy-method
-

3. SPRING CONFIGURATION

XML Configuration

- <bean> tag
- Property & constructor injection

Annotation-Based Configuration

- @Component
- @Service
- @Repository
- @Controller
- @Configuration
- @Bean
- @ComponentScan

Java-Based Configuration

- @Configuration
 - @Bean
 - @Import
-

4. SPRING AOP (Aspect Oriented Programming)

- Cross-cutting concerns
 - AOP vs OOP
 - Aspect, Advice, JoinPoint, Pointcut
 - Types of Advice
 - Before
 - After
 - After Returning
 - After Throwing
 - Around
 - @Aspect, @Before, @Around
-

5. SPRING JDBC

- JDBC Template
 - DataSource
 - RowMapper
 - NamedParameterJdbcTemplate
 - Exception translation
-

6. SPRING ORM & JPA

- Spring ORM overview
- Hibernate integration
- Spring Data JPA
- JpaRepository
- CRUD operations

- Query methods
 - @Query
 - Pagination & Sorting
 - Projections
-

7. TRANSACTION MANAGEMENT ★

- Programmatic transactions
 - Declarative transactions
 - @Transactional
 - Propagation types
 - Isolation levels
 - Rollback rules
-

8. SPRING MVC (WEB)

- MVC architecture
- DispatcherServlet
- Controller
- ViewResolver
- Model, View, ModelAndView

MVC Annotations

- @RequestMapping
 - @GetMapping / @PostMapping
 - @PathVariable
 - @RequestParam
 - @RequestBody
 - @ResponseBody
-

9. SPRING REST (WEB SERVICES)

- REST principles
 - HTTP methods
 - HTTP status codes
 - REST API design
 - @RestController
 - ResponseEntity
 - DTO pattern
 - Exception handling
 - @ControllerAdvice
 - @ExceptionHandler
-

10. SPRING SECURITY ★ ★ ★

- Authentication vs Authorization
 - Spring Security architecture
 - Security filters
 - In-memory authentication
 - JDBC authentication
 - JWT-based security
 - Role-based access control
-

11. SPRING BOOT

- What is Spring Boot
 - Auto-configuration
 - Starter dependencies
 - application.properties / application.yml
 - Profiles
 - Embedded Tomcat
 - Actuator
-

12. MICROSERVICES WITH SPRING

- Monolithic vs Microservices
 - Spring Cloud overview
 - Config Server
 - Eureka Server
 - Feign Client
 - Load Balancer
 - API Gateway
 - Circuit Breaker (Resilience4j)
-

13. SPRING + KAFKA

- Kafka basics
 - Producer & Consumer
 - KafkaTemplate
 - @KafkaListener
 - Error handling
 - Retry & Dead Letter Queue (DLQ)
-

14. TESTING IN SPRING

- JUnit
 - Mockito
 - @SpringBootTest
 - @WebMvcTest
 - @MockBean
 - Integration testing
-

15. DEPLOYMENT & DEVOPS BASICS

- Packaging (JAR/WAR)
 - Docker basics
 - AWS EC2 deployment
 - CI/CD overview
 - Logging & Monitoring
-

16. INTERVIEW & REAL-TIME TOPICS ★

- Bean lifecycle (real-time)
- @Component vs @Bean
- @Controller vs @RestController
- Lazy vs Eager loading
- DTO vs Entity
- Exception handling best practices