HackForge

SpringBoot Certification Training

15 Hours

Live Online | Andhra Pradesh | Telangana | Tamil Nadu | Karnataka

Phone :9884789292

Spring Boot Backend

Module 1: Spring Boot Fundamentals (Foundation)

Rapid backend application development

- Starter dependencies
- Auto-configuration
- application.properties vs application.yml
- Profiles & environment configuration
- Embedded servers (Tomcat)

Module 2: Global Exception Handling

Production-ready API error handling

- Exception handling strategy
- @ControllerAdvice
- @ExceptionHandler
- Custom error response structure
- Standard REST error format design

Module 3: Spring Data JPA & Hibernate (Persistence Layer)

Database integration with ORM

JPA Basics

- Entity mapping
- @Entity
- @Table
- @Id
- @GeneratedValue

Relationships

- OneToOne
- OneToMany
- ManyToOne
- ManyToMany

Repository Layer

- CrudRepository
- JpaRepository
- Custom queries
- JPQL
- Native queries

Module 4: Spring Security + JWT Authentication ⭐

Enterprise authentication system

Security Fundamentals

- Authentication vs Authorization
- Security Filter Chain

Spring Security Basics

- In-memory authentication
- Database authentication
- UserDetailsService
- Password encoding (BCrypt)

JWT Authentication

- Token structure
- Token generation
- Token validation
- Stateless authentication
- Refresh tokens

Role-Based Access Control

- @PreAuthorize
- @RolesAllowed

MySQL

Module 1: Introduction to Databases

- What is DBMS
- What is RDBMS
- Features of MySQL
- Installing MySQL Server & Workbench
- Creating database
- Selecting database

Commands:

```
CREATE DATABASE academy;

USE academy;
```

```
SHOW DATABASES;
```

Module 2: Data Types in MySQL

- Numeric types (INT, BIGINT, FLOAT, DECIMAL)
- String types (CHAR, VARCHAR, TEXT)
- Date & time types (DATE, DATETIME, TIMESTAMP)
- Boolean type
- ENUM & SET (optional)

Module 3: Table Creation & Structure

- CREATE TABLE
- DESCRIBE TABLE
- ALTER TABLE
- DROP TABLE
- TRUNCATE TABLE
- Rename table

Example:

```
CREATE TABLE students (
 id INT PRIMARY KEY AUTO_INCREMENT,
 name VARCHAR(100),
 email VARCHAR(100),
 age INT
);
```

Module 4: CRUD Operations (Core SQL)

INSERT

INSERT INTO students(name, age)

VALUES ('Praveen', 22);

SELECT

SELECT * FROM students;

UPDATE

UPDATE students

SET age = 23

WHERE id = 1;

DELETE

DELETE FROM students

WHERE id = 1;

Module 5: Constraints

- PRIMARY KEY
- FOREIGN KEY
- UNIQUE
- NOT NULL
- DEFAULT
- CHECK (concept)

Example:

email VARCHAR(100) UNIQUE

Module 6: Filtering Data

- WHERE clause
- AND, OR, NOT
- BETWEEN
- IN
- LIKE
- IS NULL

Example:

```
SELECT * FROM students

WHERE age BETWEEN 18 AND 25;
```

Module 7: Sorting & Limiting Data

- ORDER BY ASC / DESC
- LIMIT
- DISTINCT

Example:

```
SELECT * FROM students

ORDER BY age DESC

LIMIT 5;
```

Module 8: Aggregate Functions

- COUNT()
- SUM()
- AVG()
- MIN()

- MAX()

Example:

```
SELECT COUNT(*) FROM students;
```

Module 9: GROUP BY & HAVING

- GROUP BY usage
- HAVING vs WHERE difference

Example:

```
SELECT age, COUNT(*)

FROM students

GROUP BY age;
```

Module 10: Joins (Very Important)

- INNER JOIN
- LEFT JOIN
- RIGHT JOIN
- SELF JOIN (optional)

Example:

```
SELECT students.name, courses.title

FROM students

INNER JOIN courses

ON students.course_id = courses.id;
```

Module 11: Keys & Relationships

- Primary key concept
- Foreign key relationships
- One-to-One
- One-to-Many
- Many-to-Many

Example:

```
FOREIGN KEY (course_id)

REFERENCES courses(id)
```

Module 12: Indexes

- What is indexing
- Creating index
- Unique index
- Composite index
- Performance benefits

Example:

```
CREATE INDEX idx_email

ON students(email);
```

Module 13: Views

- What is a view
- Creating view
- Updating view
- Dropping view

Example:

```
CREATE VIEW active_students AS

SELECT * FROM students

WHERE status = 'active';
```

Module 17: Subqueries

- Single-row subquery
- Multi-row subquery
- Nested queries

Example:

```
SELECT name

FROM students

WHERE age > (SELECT AVG(age) FROM students);
```

Module 18: Advanced Queries

- EXISTS
- ANY
- ALL
- CASE statement

Module 8: Docker & CI/CD (GitHub Actions) ⭐

DevOps workflow for backend engineers

Docker

- Docker architecture
- Dockerfile creation
- Image vs Container
- Multi-stage builds
- Docker Compose

GitHub Actions

- CI workflow setup
- Build & test pipeline
- Docker image build
- Push to Docker Hub / ECR

Module 9: AWS Deployment ☁️

Production deployment strategies

Core AWS Services

- EC2
- S3
- RDS
- IAM basics

Deployment Options

- EC2 + Docker deployment
- Elastic Beanstalk
- ECS (overview)

AWS Best Practices

- Environment variables
- Secrets management
- Monitoring
- Logging

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+919884789292