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## **Spring Boot (Java)**

### **Project Structure**

#### **Springboot**

```
|—src/main/java/com/example/crud
|   |—controller/StudentController.java
|   |—service/StudentService.java
|   |—repository/StudentRepository.java
|   |—model/Student.java
|   └—SpringbootCrudApplication.java
|—src/main/resources/application.properties
└—pom.xml
```

---

#### **Pom.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns=http://maven.apache.org/POM/4.0.0
```

xmlns:xsi=<http://www.w3.org/2001/XMLSchema-instance>

xsi:schemaLocation=<http://maven.apache.org/POM/4.0.0>  
<https://maven.apache.org/xsd/maven-4.0.0.xsd>>

<modelVersion>4.0.0</modelVersion>

<groupId>com.example</groupId>

<artifactId>springboot-crud</artifactId>

<version>1.0.0</version>

<parent>

<groupId>org.springframework.boot</groupId>

<artifactId>spring-boot-starter-parent</artifactId>

<version>3.2.0</version>

</parent>

<dependencies>

<!--Spring Web →

<dependency>

<groupId>org.springframework.boot</groupId>

<artifactId>spring-boot-starter-web</artifactId>

</dependency>

<!--JPA & Hibernate →

<dependency>

```
<groupId>org.springframework.boot</groupId>
<artifactId>spring-boot-starter-data-jpa</artifactId>
</dependency>

<!--In-Memory H2 Database →
<dependency>
  <groupId>com.h2database</groupId>
  <artifactId>h2</artifactId>
  <scope>runtime</scope>
</dependency>

<!--Testing →
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-test</artifactId>
  <scope>test</scope>
</dependency>
</dependencies>
</project>
```

---

## **Main Application**

```
Package com.example.crud;
```

```
Import org.springframework.boot.SpringApplication;
```

```
Import org.springframework.boot.autoconfigure.SpringBootApplication;
```

```
@SpringBootApplication
```

```
Public class SpringbootCrudApplication{
```

```
    Public static void main(String[] args){
```

```
        SpringApplication.run(SpringbootCrudApplication.class, args);
```

```
        System.out.println("Spring Boot CRUD Application Running...");
```

```
    }
```

```
}
```

---

## **Student Model**

```
Package com.example.crud.model;
```

```
Import jakarta.persistence.Entity;
```

```
Import jakarta.persistence.GeneratedValue;
```

```
Import jakarta.persistence.Id;
```

```
@Entity
```

```
Public class Student {
```

```
    @Id
```

```
    @GeneratedValue
```

```
    Private Integer id;
```

```
    Private String name;
```

```
    Private String course;
```

```
    Public Integer getId() {
```

```
        Return id;
```

```
    }
```

```
    Public void setId(Integer id) {
```

```
        This.id = id;
```

```
    }
```

```
    Public String getName() {
```

```
        Return name;
```

```
    }
```

```
    Public void setName(String name) {
```

```
        This.name = name;
```

```
    }
```

```
PublicStringgetCourse(){
```

```
    Return course;
```

```
}
```

```
PublicvoidsetCourse(String course){
```

```
    This.course=course;
```

```
}
```

```
}
```

---

## **Repository**

```
Package com.example.crud.repository;
```

```
Import com.example.crud.model.Student;
```

```
Import org.springframework.data.jpa.repository.JpaRepository;
```

```
Publicinterface StudentRepository extends JpaRepository<Student, Integer>{
```

```
}
```

---

## **Service**

```
Package com.example.crud.service;
```

```
Import com.example.crud.model.Student;
```

```
Import com.example.crud.repository.StudentRepository;
```

```
Import org.springframework.beans.factory.annotation.Autowired;
```

```
Import org.springframework.stereotype.Service;
```

```
Import java.util.List;
```

```
@Service
```

```
Public class StudentService {
```

```
    @Autowired
```

```
    Private StudentRepository repo;
```

```
    Public Student save(Student student) {
```

```
        Return repo.save(student);
```

```
    }
```

```
    Public List<Student> getAll() {
```

```
        Return repo.findAll();
```

```
    }
```

```
Public Student getById(Integer id){  
    Return repo.findById(id).orElse(null);  
}
```

```
Public String delete(Integer id){  
    Repo.deleteById(id);  
    Return "Deleted Successfully";  
}  
}
```

---

## **Controller**

```
Package com.example.crud.controller;
```

```
Import com.example.crud.model.Student;
```

```
Import com.example.crud.service.StudentService;
```

```
Import org.springframework.beans.factory.annotation.Autowired;
```

```
Import org.springframework.web.bind.annotation.*;
```

```
Import java.util.List;
```

```
@RestController
```



```
@RequestMapping("/students")
```

```
Public class StudentController{
```

```
    @Autowired
```

```
    Private StudentService service;
```

```
    @PostMapping("/add")
```

```
    Public Student add(@RequestBody Student student) {
```

```
        Return service.save(student);
```

```
    }
```

```
    @GetMapping("/all")
```

```
    Public List<Student> list() {
```

```
        Return service.getAll();
```

```
    }
```

```
    @GetMapping("/{id}")
```

```
    Public Student find(@PathVariable Integer id){
```

```
        Return service.getByld(id);
```

```
    }
```

```
    @DeleteMapping("/delete/{id}")
```

```
    Public String delete(@PathVariable Integer id){
```

```
        Return service.delete(id);
```

```
}  
}
```

---

### ***Application.properties***

*Server.port=8080*

*Spring.h2.console.enabled=true*

*Spring.datasource.url=jdbc:h2:mem:testdb*

---

### ***Run Project***

*Mvn spring-boot:run*

---

### ***Testing (Postman / Browser)***

| <i>Method</i> | <i>URL</i> |
|---------------|------------|
|---------------|------------|

|            |  |
|------------|--|
| <i>GET</i> | <i><a href="http://localhost:8080/students/all">http://localhost:8080/students/all</a></i> |
|------------|--|

POST <http://localhost:8080/students/add>

GET <http://localhost:8080/students/1>

DELETE <http://localhost:8080/students/delete/1>

*Example Body (POST)*

```
{  
  "name": "Arun",  
  "course": "CSE"  
}
```

---

**Done!**

*This is a complete working Spring Boot CRUD backend project.*

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## **Spring Boot CRUD Example (Java)**

### **Project Structure**

#### **Springboot-crud/**

```
|—src/main/java/com/example/crud
|   |—controller/StudentController.java
|   |—service/StudentService.java
|   |—repository/StudentRepository.java
|   |—model/Student.java
|   └—SpringbootCrudApplication.java
|—src/main/resources/application.properties
└—pom.xml
```

---

#### **Pom.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<project xmlns=http://maven.apache.org/POM/4.0.0
```

```
    xmlns:xsi=http://www.w3.org/2001/XMLSchema-instance
```

Xsi:schemaLocation=<http://maven.apache.org/POM/4.0.0>  
<https://maven.apache.org/xsd/maven-4.0.0.xsd>>

<modelVersion>4.0.0</modelVersion>

<groupId>com.example</groupId>

<artifactId>springboot-crud</artifactId>

<version>1.0.0</version>

<parent>

<groupId>org.springframework.boot</groupId>

<artifactId>spring-boot-starter-parent</artifactId>

<version>3.2.0</version>

</parent>

<dependencies>

<!--Spring Web →

<dependency>

<groupId>org.springframework.boot</groupId>

<artifactId>spring-boot-starter-web</artifactId>

</dependency>

<!--JPA & Hibernate →

<dependency>

<groupId>org.springframework.boot</groupId>

```
        <artifactId>spring-boot-starter-data-jpa</artifactId>
    </dependency>

    <!--In-Memory H2 Database →
    <dependency>

        <groupId>com.h2database</groupId>

        <artifactId>h2</artifactId>

        <scope>runtime</scope>
    </dependency>

    <!--Testing →
    <dependency>

        <groupId>org.springframework.boot</groupId>

        <artifactId>spring-boot-starter-test</artifactId>

        <scope>test</scope>
    </dependency>
</dependencies>
</project>
```

---

## **Main Application**

```
Package com.example.crud;
```

```
Import org.springframework.boot.SpringApplication;
Import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication

Public class SpringbootCrudApplication{

    Public static void main(String[] args){

        SpringApplication.run(SpringbootCrudApplication.class, args);
        System.out.println("Spring Boot CRUD Application Running...");
    }
}
```

---

## **Student Model**

```
Package com.example.crud.model;

Import jakarta.persistence.Entity;
Import jakarta.persistence.GeneratedValue;
Import jakarta.persistence.Id;

@Entity

Public class Student{
```

@Id

@GeneratedValue

Private Integer id;

Private String name;

Private String course;

Public Integer getId(){

Return id;

}

Public void setId(Integer id){

This.id=id;

}

Public String getName(){

Return name;

}

Public void setName(String name){

This.name=name;

}

Public String getCourse(){



```
    Return course;
}
```

```
Public void setCourse(String course) {
    This.course = course;
}
}
```

---

## **Repository**

```
Package com.example.crud.repository;
```

```
Import com.example.crud.model.Student;
```

```
Import org.springframework.data.jpa.repository.JpaRepository;
```

```
Public interface StudentRepository extends JpaRepository<Student, Integer>{
}
```

---

## **Service**

```
Package com.example.crud.service;
```

```
Import com.example.crud.model.Student;
```

```
Import com.example.crud.repository.StudentRepository;
```

```
Import org.springframework.beans.factory.annotation.Autowired;
```

```
Import org.springframework.stereotype.Service;
```

```
Import java.util.List;
```

```
@Service
```

```
Public class StudentService {
```

```
    @Autowired
```

```
    Private StudentRepository repo;
```

```
    Public Student save(Student student) {
```

```
        Return repo.save(student);
```

```
    }
```

```
    Public List<Student> getAll() {
```

```
        Return repo.findAll();
```

```
    }
```

```
    Public Student getByld(Integer id) {
```

```
        Return repo.findById(id).orElse(null);
    }

    Public String delete(Integer id){
        Repo.deleteByld(id);
        Return "Deleted Successfully";
    }
}
```

---

## **Controller**

```
Package com.example.crud.controller;

Import com.example.crud.model.Student;
Import com.example.crud.service.StudentService;
Import org.springframework.beans.factory.annotation.Autowired;
Import org.springframework.web.bind.annotation.*;

Import java.util.List;

@RestController
@RequestMapping("/students")
```

```
Public class StudentController {

    @Autowired

    Private StudentService service;

    @PostMapping("/add")

    Public Student add(@RequestBody Student student) {

        Return service.save(student);

    }

    @GetMapping("/all")

    Public List<Student> list() {

        Return service.getAll();

    }

    @GetMapping("/{id}")

    Public Student find(@PathVariable Integer id) {

        Return service.getById(id);

    }

    @DeleteMapping("/delete/{id}")

    Public String delete(@PathVariable Integer id) {

        Return service.delete(id);

    }

}
```

```
}
```

---

### ***Application.properties***

*Server.port=8080*

*Spring.h2.console.enabled=true*

*Spring.datasource.url=jdbc:h2:mem:testdb*

---

### ***Run Project***

*Mvn spring-boot:run*

---

### ***Testing (Postman / Browser)***

| Method | URL |
|--------|-----|
|--------|-----|

|     |   |
|-----|---|
| GET | <a href="http://localhost:8080/students/all">http://localhost:8080/students/all</a> |
|-----|---|

|      |   |
|------|---|
| POST | <a href="http://localhost:8080/students/add">http://localhost:8080/students/add</a> |
|------|---|

GET <http://localhost:8080/students/1>

DELETE <http://localhost:8080/students/delete/1>

*Example Body (POST)*

```
{  
  "name": "Arun",  
  "course": "CSE"  
}
```

---

**Done!**

*This is a complete working Spring Boot CRUD backend project.*

---