

---

## **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...");}
}
```

---

## **StudentModel**

```
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(Stringcourse){
```

```
    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.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	<u><a href="http://localhost:8080/students/all">http://localhost:8080/students/all</a></u>
-----	--

*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-MemoryH2Database →

<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 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.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 <http://localhost:8080/students/all>*

*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.*

---