

# Spring Boot Based Web Application for a Simplified Online School System

## 1. Project Objective

Develop a Spring Boot web application to manage Courses and Students with a many-to-one relationship.

## 2. Course Entity

Create a Course entity with the following attributes:

- courseId (Long)
- courseName (String)
- courseDescription (String)
- credits (int)
- students (List)

Use JPA annotations to map the Course class to a database table.

## 3. Student Entity

Create a Student entity with the following attributes:

- studentId (Long)
- firstName (String)
- lastName (String)
- email (String)
- course (Course)

Each Student must be linked to exactly one Course.

## 4. Relationship Mapping

Establish a many-to-one relationship between Student and Course.

Use @ManyToOne in Student and @OneToMany in Course.

## 5. Course Creation API

POST /courses - Create a new course.

## 6. Student Creation API

POST /students/{courseId} - Create a student and assign to a course.

## 7. Student Retrieval API

GET /students/{studentId} - Retrieve student details.

## 8. Input Format

Course: courseName, courseDescription, credits

Student: firstName, lastName, email, courseId

## 9. Output Format

Display created records with success messages.

## 10. Notes

Follow standard Java naming conventions and use Spring Data JPA.

# Personal Shortcuts & Revision Notes

1. The table having the foreign key is always the Many-To-One (Owning Side).

Example: Student table has course\_id → Student is the owner.

2. The table without foreign key is One-To-Many (Inverse Side).

3. In OneToMany, use @JsonIgnore to avoid infinite recursion errors.

4. In the FK owning table, always use @JoinColumn(name="course\_id").

5. Use mappedBy in OneToMany to refer to the variable name in the owning entity.

Example: @OneToMany(mappedBy="course").

6. Always use Wrapper class Long instead of primitive long for IDs.

Reason: long cannot hold null, Long can hold null.

7. Follow both CamelCase and Snake\_Case naming conventions.

Java → firstName, courseDescription

DB → first\_name, course\_description

Shortcut: FK table → ManyToOne + JoinColumn | No FK → OneToMany + mappedBy + JsonIgnore | Use Long | Follow naming rules