Spring Data JPA - Attributes of @Column Annotation with Example

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Spring Data JPA is a powerful framework that simplifies database interactions in Spring Boot applications. The **@Column annotation in Spring Data JPA** is widely used to customize column properties such as length, default values, and constraints in a database table. Understanding how to use @Column effectively helps optimize database performance and maintain data integrity.

In this article, we will explore the most important **attributes of the @Column annotation in Spring Boot applications** with practical examples.

Prerequisites:

Before we start, ensure you have the following:

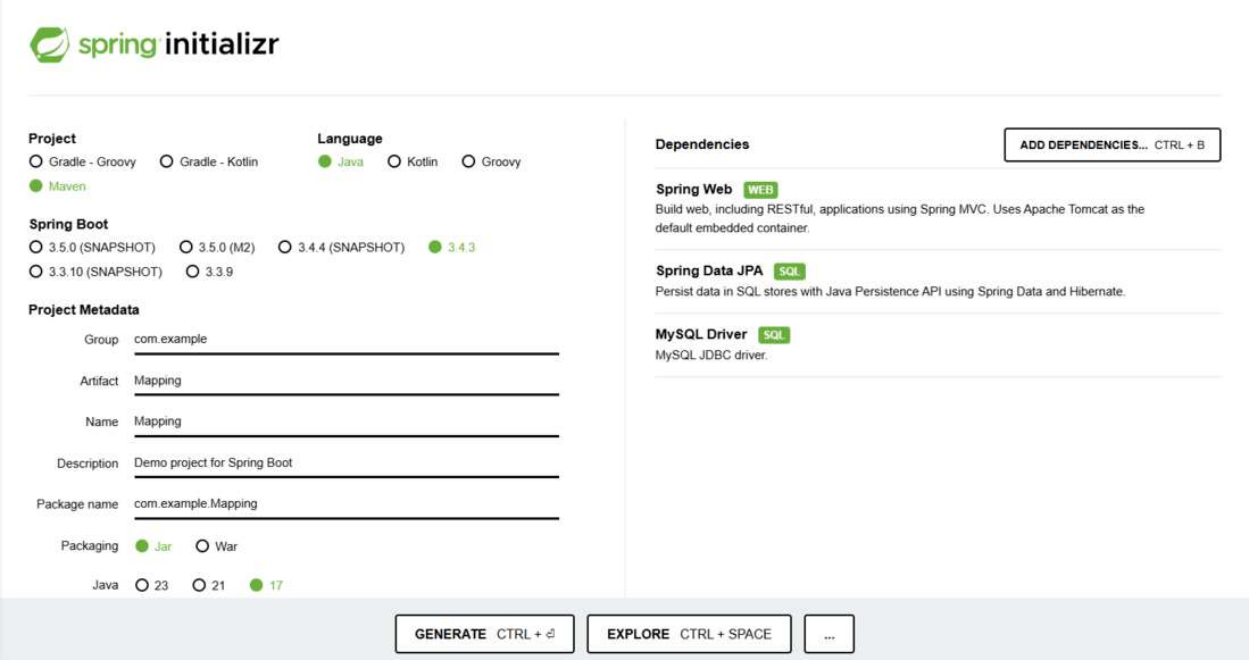
- Java 17+ (Recommended for Spring Boot 3.x)
- Spring Boot 3.x
- Spring Data JPA
- MySQL Database
- IDE (IntelliJ IDEA, Eclipse, or VS Code)

Setting Up the Spring Boot Project

Step 1: Create a Spring Boot Project

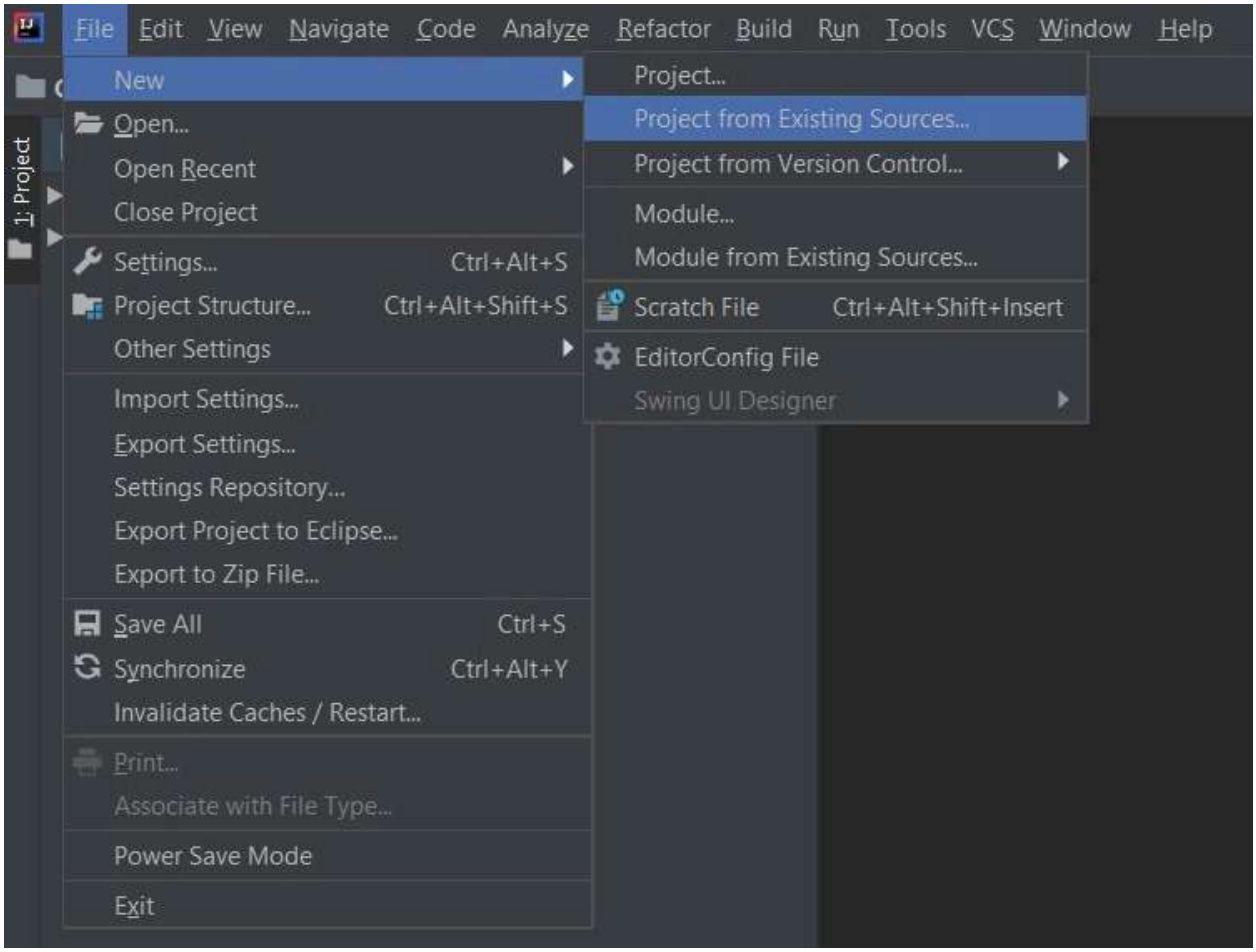
Go to Spring Initializr and create a new project with the following configurations:

- **Project:** Maven
- **Language**: Java
- **Spring Boot Version**: 3.x (Latest Stable version)
- **Packaging:** JAR
- **Java:** 17 or later
- **Dependencies**: Spring Web, Spring Data JPA, MySql Driver



Click on Generate which will download the starter project.

Extract the zip file. Now open a suitable IDE and then go to File > New > Project from Existing Sources and select pom.xml. Click on import changes on prompt and wait for the project to sync as pictorially depicted below as follows:

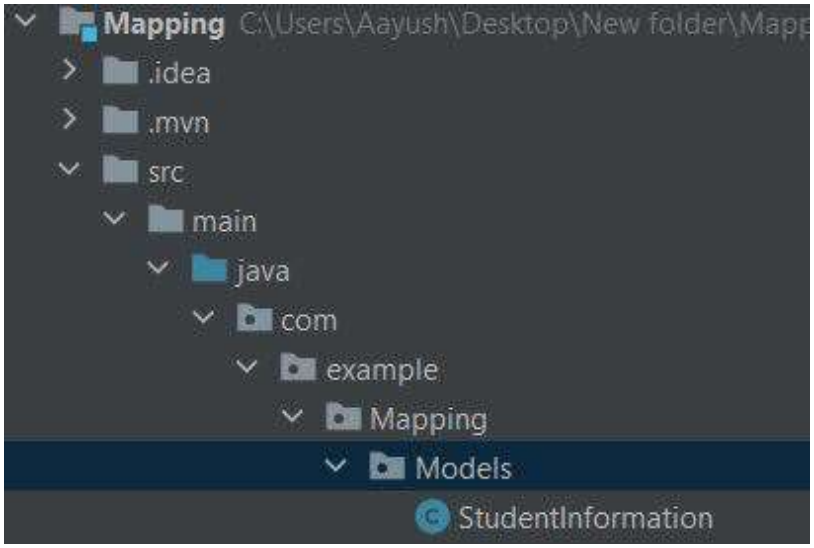


Step 2: Configure Database in application.properties

Update the **application.properties** file with your MySQL database credentials. (mapping is the database name)

```
spring.datasource.url=jdbc:mysql://localhost:3306/mapping
spring.datasource.username=${DB_USERNAME}
spring.datasource.password=${DB_PASSWORD}
spring.jpa.hibernate.ddl-auto=update
```

Project Structure:



Using @Column Annotation in Entity Class

1. Setting Column Length

The @Column(length = n) attribute defines the maximum size of a column in the database.

StudentInformation.java:

```
import jakarta.persistence.*;
import lombok.*;

@Entity
@Table(name = "Student")
@Getter
@Setter
@NoArgsConstructor
@AllArgsConstructor
public class StudentInformation {
    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    private int rollno;

    @Column(name = "student_name", length = 30)
    private String name;
}
```

Generated MySQL Table:

CREATE TABLE Student (

```
    rollno INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(255),
    student_name VARCHAR(30)
);
```

Run the main application:

```
: HCANN000001: Hibernate Commons Annotations {5.1.2.Final}
: HikariPool-1 - Starting...
: HikariPool-1 - Start completed.
: HHH000400: Using dialect: org.hibernate.dialect.MySQL8Dialect
: HHH000490: Using JtaPlatform implementation: [org.hibernate.engine.transacti
: Initialized JPA EntityManagerFactory for persistence unit 'default'
: spring.jpa.open-in-view is enabled by default. Therefore, database queries m
: Tomcat started on port(s): 8080 (http) with context path ''
: Started MappingApplication in 6.117 seconds (JVM running for 6.762)
```

Database output:

```
mysql> desc student;
+--------------+--------------+------+-----+---------+----------------+
| Field        | Type         | Null | Key | Default | Extra          |
+--------------+--------------+------+-----+---------+----------------+
| rollno       | int          | NO   | PRI | NULL    | auto_increment |
| name         | varchar(255) | NO   |     | NULL    |                |
| student_name | varchar(30)  | YES  |     | NULL    |                |
+--------------+--------------+------+-----+---------+----------------+
3 rows in set (0.01 sec)
```

2. Adding the default value in the column

The recommended approach to set default values is by initializing the field.

```
@Column(nullable = false)
private String name = "Default Name";
```

StudentInformation.java:

```
import jakarta.persistence.*;
import lombok.*;

@Entity
```

```java
@Table(name = "Student")
@Getter
@Setter
@NoArgsConstructor
@AllArgsConstructor
public class StudentInformation {
    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    private int rollno;

    @Column(nullable = false)
    private String name = "Default Name";
}
```

Run the main application:

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Database output:

```
mysql> desc student;
+--------+--------------+------+-----+-----------+----------------+
| Field  | Type         | Null | Key | Default   | Extra          |
+--------+--------------+------+-----+-----------+----------------+
| rollno | int          | NO   | PRI | NULL      | auto_increment |
| name   | varchar(255) | YES  |     | John Snow |                |
+--------+--------------+------+-----+-----------+----------------+
2 rows in set (0.00 sec)
```

3. Adding a not-null Constraint to the Column

To enforce a NOT NULL constraint, use:

@Column(nullable = false)

private String name;

StudentInformation.java:

```java
import jakarta.persistence.*;
import lombok.*;

@Entity
@Table(name = "Student")
@Getter
@Setter
@NoArgsConstructor
@AllArgsConstructor
public class StudentInformation {
    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
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```

Database Output:

```
mysql> desc student;
+--------+--------------+------+-----+---------+----------------+
| Field  | Type         | Null | Key | Default | Extra          |
+--------+--------------+------+-----+---------+----------------+
| rollno | int          | NO   | PRI | NULL    | auto_increment |
| name   | varchar(255) | NO   |     | NULL    |                |
+--------+--------------+------+-----+---------+----------------+
2 rows in set (0.00 sec)
```