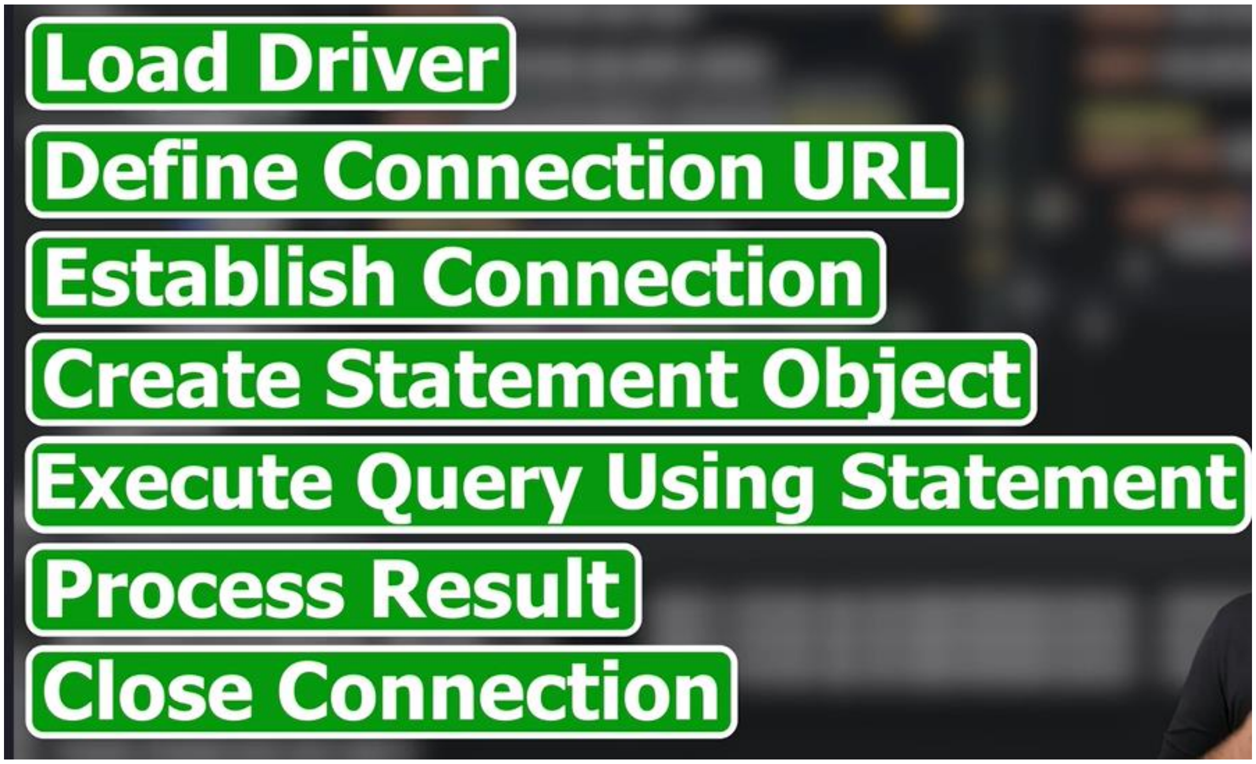
Spring JDBC Introduction:

When we use normal JDBC.

We need all the below steps:



Load Driver

Define Connection URL

Establish Connection

Create Statement Object

Execute Query Using Statement

Process Result

Close Connection

To solve we have Spring JDBC

We have one important Component JDBC template which helps us to

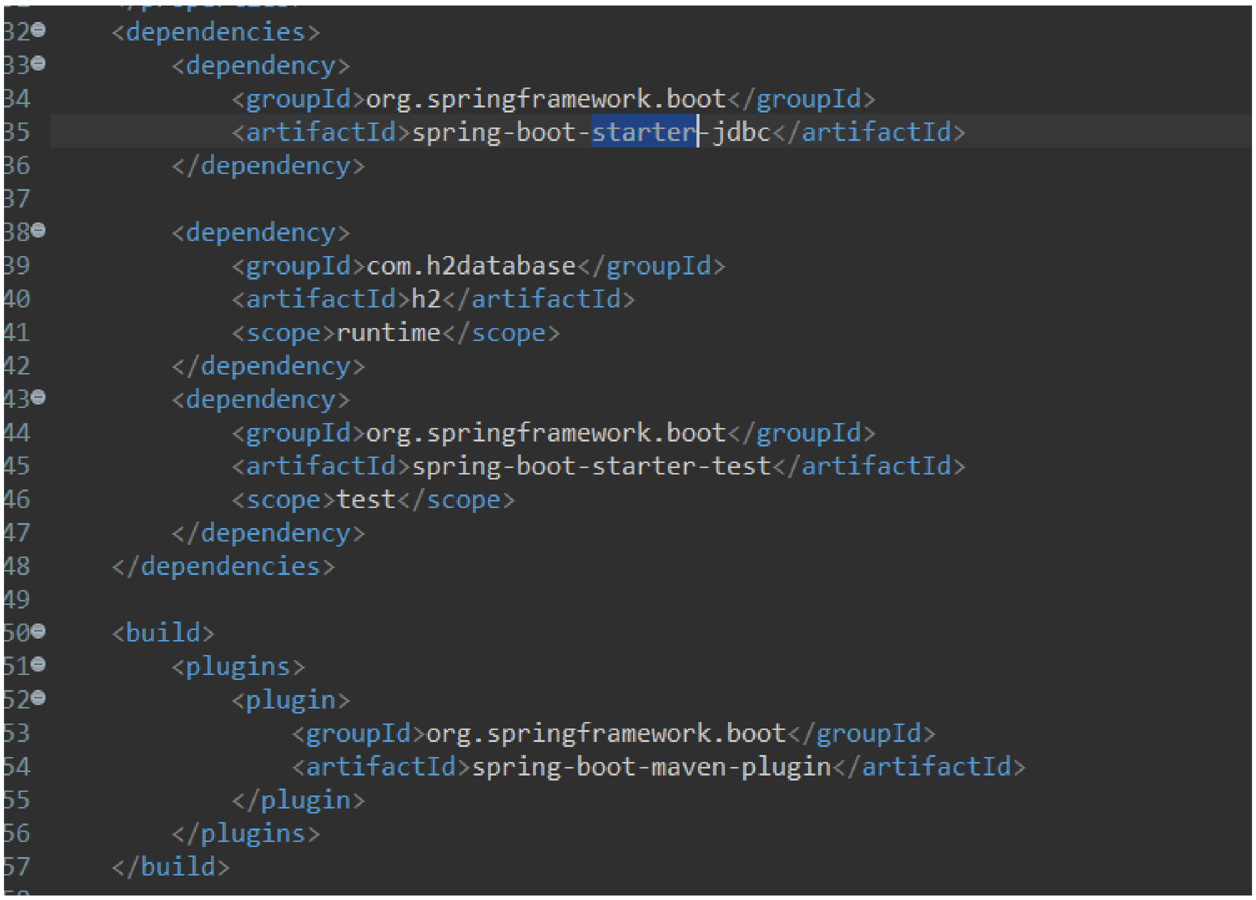
H2 is a in-memory database, using which you can create a database, you can store data there, and then you can fetch data.

The only problem is by default it is in-memory which means the moment you close your application, we will lose the data.

Dependencies added as a part of Spring JDBC

JDBC API

H2



```xml
    <dependencies>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-jdbc</artifactId>
        </dependency>

        <dependency>
            <groupId>com.h2database</groupId>
            <artifactId>h2</artifactId>
            <scope>runtime</scope>
        </dependency>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-test</artifactId>
            <scope>test</scope>
        </dependency>
    </dependencies>

    <build>
        <plugins>
            <plugin>
                <groupId>org.springframework.boot</groupId>
                <artifactId>spring-boot-maven-plugin</artifactId>
            </plugin>
        </plugins>
    </build>
```

Service Layer : Where it will have all the business logic. There can be many functionalities associated to the Student.

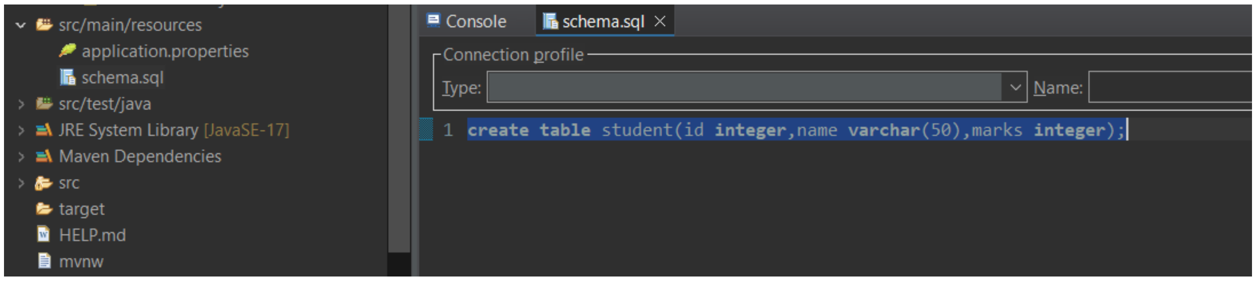
Repository Layer : Where database Operations will be carried and returns the result.

Model --Basically like a form.

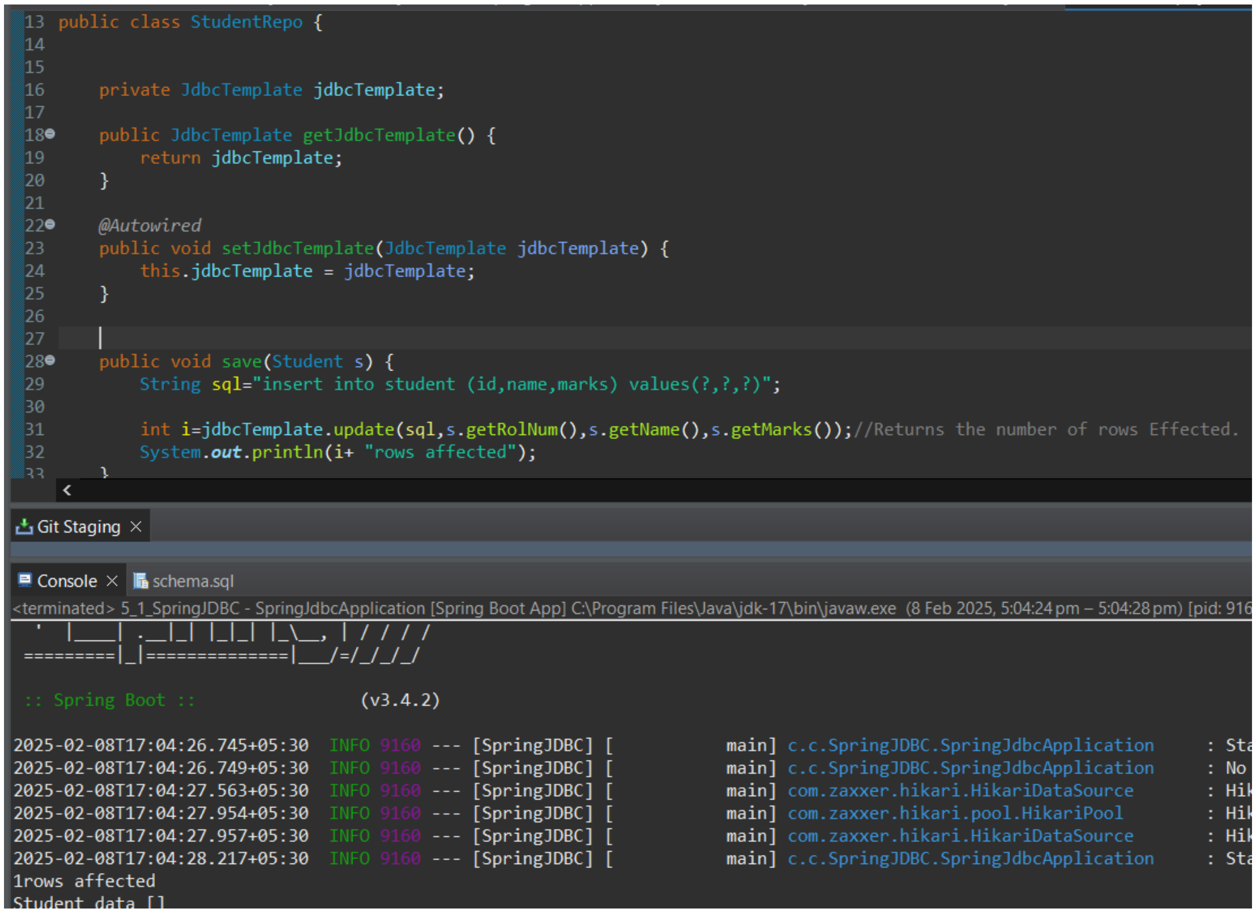
Each Layer will have Specific Purpose.

Before working with any table we need to create them .To create a schema in H2 database in Spring Boot, you can use the schema.sql file. Place this file in the src/main/resources directory.

create table student(id integer,name varchar(50),marks integer); --Table with name student will be created.



```
create table student(id integer,name varchar(50),marks integer);
```



```
public class StudentRepo {


    private JdbcTemplate jdbcTemplate;

    public JdbcTemplate getJdbcTemplate() {
        return jdbcTemplate;
    }

    @Autowired
    public void setJdbcTemplate(JdbcTemplate jdbcTemplate) {
        this.jdbcTemplate = jdbcTemplate;
    }


    public void save(Student s) {
        String sql="insert into student (id,name,marks) values(?,?,?)";

        int i=jdbcTemplate.update(sql,s.getRolNum(),s.getName(),s.getMarks());//Returns the number of rows Effected.
        System.out.println(i+ "rows affected");
    }
```

```
<terminated> 5_1_SpringJDBC - SpringJdbcApplication [Spring Boot App] C:\Program Files\Java\jdk-17\bin\javaw.exe  (8 Feb 2025, 5:04:24 pm – 5:04:28 pm) [pid: 916
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 :: Spring Boot ::                (v3.4.2)

2025-02-08T17:04:26.745+05:30  INFO 9160 --- [SpringJDBC] [           main] c.c.SpringJDBC.SpringJdbcApplication     : Sta
2025-02-08T17:04:26.749+05:30  INFO 9160 --- [SpringJDBC] [           main] c.c.SpringJDBC.SpringJdbcApplication     : No
2025-02-08T17:04:27.563+05:30  INFO 9160 --- [SpringJDBC] [           main] com.zaxxer.hikari.HikariDataSource       : Hik
2025-02-08T17:04:27.954+05:30  INFO 9160 --- [SpringJDBC] [           main] com.zaxxer.hikari.pool.HikariPool        : Hik
2025-02-08T17:04:27.957+05:30  INFO 9160 --- [SpringJDBC] [           main] com.zaxxer.hikari.HikariDataSource       : Hik
2025-02-08T17:04:28.217+05:30  INFO 9160 --- [SpringJDBC] [           main] c.c.SpringJDBC.SpringJdbcApplication     : Sta
1rows affected
Student data []
```
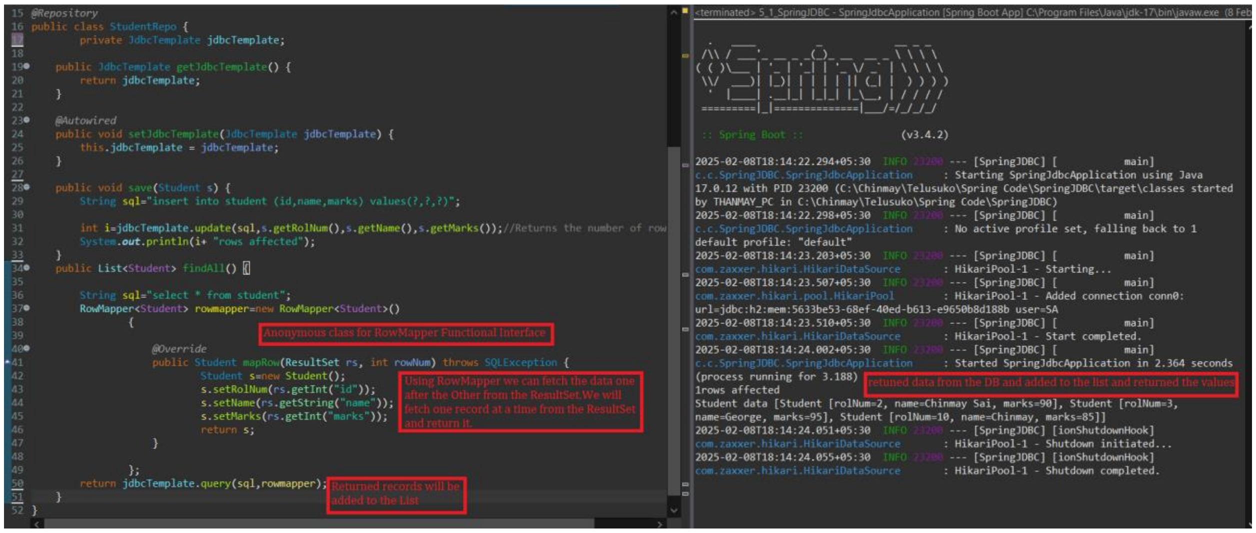

As the Schema has been created we were able to insert the data into the table and in the output we could see 1 row has been affected.

Fetching the data from the H2 Database



```java
@Repository
public class StudentRepo {
        private JdbcTemplate jdbcTemplate;

    public JdbcTemplate getJdbcTemplate() {
        return jdbcTemplate;
    }

    @Autowired
    public void setJdbcTemplate(JdbcTemplate jdbcTemplate) {
        this.jdbcTemplate = jdbcTemplate;
    }

    public void save(Student s) {
        String sql="insert into student (id,name,marks) values(?,?,?)";

        int i=jdbcTemplate.update(sql,s.getRolNum(),s.getName(),s.getMarks());//Returns the number of row
        System.out.println(i+ "rows affected");
    }
    public List<Student> findAll() {

        String sql="select * from student";
        RowMapper<Student> rowmapper=new RowMapper<Student>()
                {

                    @Override
                    public Student mapRow(ResultSet rs, int rowNum) throws SQLException {
                            Student s=new Student();
                            s.setRolNum(rs.getInt("id"));
                            s.setName(rs.getString("name"));
                            s.setMarks(rs.getInt("marks"));
                            return s;
                    }

                };
        return jdbcTemplate.query(sql,rowmapper);
    }
}
```

Anonymous class for RowMapper Functional Interface

Using RowMapper we can fetch the data one after the Other from the ResultSet.We will fetch one record at a time from the ResultSet and return it.

Returned records will be added to the List

```
<terminated> 5_1_SpringJDBC - SpringJdbcApplication [Spring Boot App] C:\Program Files\Java\jdk-17\bin\javaw.exe  (8 Feb

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2025-02-08T18:14:22.294+05:30  INFO 23200 --- [SpringJDBC] [           main]
c.c.SpringJDBC.SpringJdbcApplication     : Starting SpringJdbcApplication using Java
17.0.12 with PID 23200 (C:\Chinmay\Telusuko\Spring Code\SpringJDBC\target\classes started
by THANMAY_PC in C:\Chinmay\Telusuko\Spring Code\SpringJDBC)
2025-02-08T18:14:22.298+05:30  INFO 23200 --- [SpringJDBC] [           main]
c.c.SpringJDBC.SpringJdbcApplication     : No active profile set, falling back to 1
default profile: "default"
2025-02-08T18:14:23.203+05:30  INFO 23200 --- [SpringJDBC] [           main]
com.zaxxer.hikari.HikariDataSource       : HikariPool-1 - Starting...
2025-02-08T18:14:23.507+05:30  INFO 23200 --- [SpringJDBC] [           main]
com.zaxxer.hikari.pool.HikariPool        : HikariPool-1 - Added connection conn0:
url=jdbc:h2:mem:5633be53-68ef-40ed-b613-e9650b8d188b user=SA
2025-02-08T18:14:23.510+05:30  INFO 23200 --- [SpringJDBC] [           main]
com.zaxxer.hikari.HikariDataSource       : HikariPool-1 - Start completed.
2025-02-08T18:14:24.002+05:30  INFO 23200 --- [SpringJDBC] [           main]
c.c.SpringJDBC.SpringJdbcApplication     : Started SpringJdbcApplication in 2.364 seconds
(process running for 3.188)
1rows affected
Student data [Student [rolNum=2, name=Chinmay Sai, marks=90], Student [rolNum=3,
name=George, marks=95], Student [rolNum=10, name=Chinmay, marks=85]]
2025-02-08T18:14:24.051+05:30  INFO 23200 --- [SpringJDBC] [ionShutdownHook]
com.zaxxer.hikari.HikariDataSource       : HikariPool-1 - Shutdown initiated...
2025-02-08T18:14:24.055+05:30  INFO 23200 --- [SpringJDBC] [ionShutdownHook]
com.zaxxer.hikari.HikariDataSource       : HikariPool-1 - Shutdown completed.
```

retuned data from the DB and added to the list and returned the values

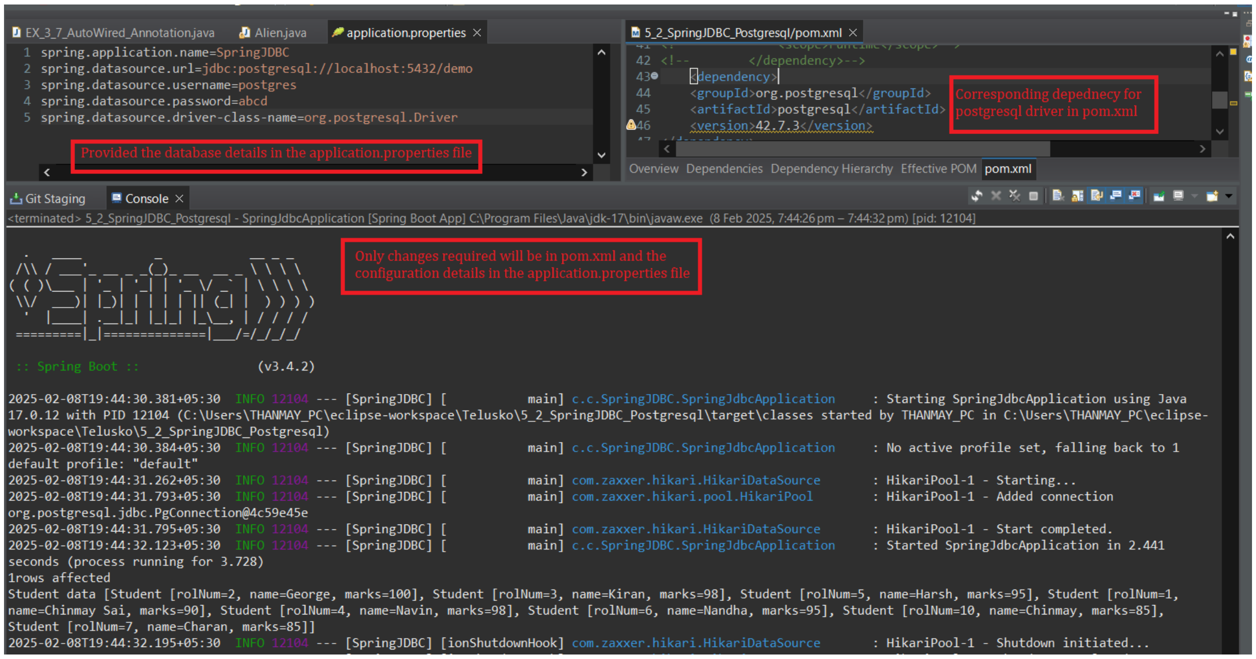
The Student class which is part of model is like a form to which we are adding the data and that returned by the RowMapper and it is added to the List.

As the H2 database is an embedded database we does not have to do any configurations.

But when we are working with any other external databases we need to provide the configuration details in the application.properties for the external database with which we want to work.

For example :

We are trying to work with postgresql so we need an dependency for postgresl and the configuration details in the application.properties


EX_3_7_AutoWired_Annotation.java
Alien.java
application.properties
5_2_SpringJDBC_Postgresql/pom.xml
Overview
Dependencies
Dependency Hierarchy
Effective POM
pom.xml
Git Staging
Console
Provided the database details in the application.properties file
Corresponding depednecy for postgresql driver in pom.xml
Only changes required will be in pom.xml and the configuration details in the application.properties file

```
spring.application.name=SpringJDBC
spring.datasource.url=jdbc:postgresql://localhost:5432/demo
spring.datasource.username=postgres
spring.datasource.password=abcd
spring.datasource.driver-class-name=org.postgresql.Driver
```

```
<!--        </dependency>-->
    <dependency>
    <groupId>org.postgresql</groupId>
    <artifactId>postgresql</artifactId>
    <version>42.7.3</version>
```

```
<terminated> 5_2_SpringJDBC_Postgresql - SpringJdbcApplication [Spring Boot App] C:\Program Files\Java\jdk-17\bin\javaw.exe  (8 Feb 2025, 7:44:26 pm – 7:44:32 pm) [pid: 12104]

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 :: Spring Boot ::                (v3.4.2)

2025-02-08T19:44:30.381+05:30  INFO 12104 --- [SpringJDBC] [           main] c.c.SpringJDBC.SpringJdbcApplication     : Starting SpringJdbcApplication using Java
17.0.12 with PID 12104 (C:\Users\THANMAY_PC\eclipse-workspace\Telusko\5_2_SpringJDBC_Postgresql\target\classes started by THANMAY_PC in C:\Users\THANMAY_PC\eclipse-
workspace\Telusko\5_2_SpringJDBC_Postgresql)
2025-02-08T19:44:30.384+05:30  INFO 12104 --- [SpringJDBC] [           main] c.c.SpringJDBC.SpringJdbcApplication     : No active profile set, falling back to 1
default profile: "default"
2025-02-08T19:44:31.262+05:30  INFO 12104 --- [SpringJDBC] [           main] com.zaxxer.hikari.HikariDataSource       : HikariPool-1 - Starting...
2025-02-08T19:44:31.793+05:30  INFO 12104 --- [SpringJDBC] [           main] com.zaxxer.hikari.pool.HikariPool        : HikariPool-1 - Added connection
org.postgresql.jdbc.PgConnection@4c59e45e
2025-02-08T19:44:31.795+05:30  INFO 12104 --- [SpringJDBC] [           main] com.zaxxer.hikari.HikariDataSource       : HikariPool-1 - Start completed.
2025-02-08T19:44:32.123+05:30  INFO 12104 --- [SpringJDBC] [           main] c.c.SpringJDBC.SpringJdbcApplication     : Started SpringJdbcApplication in 2.441
seconds (process running for 3.728)
1rows affected
Student data [Student [rolNum=2, name=George, marks=100], Student [rolNum=3, name=Kiran, marks=98], Student [rolNum=5, name=Harsh, marks=95], Student [rolNum=1,
name=Chinmay Sai, marks=90], Student [rolNum=4, name=Navin, marks=98], Student [rolNum=6, name=Nandha, marks=95], Student [rolNum=10, name=Chinmay, marks=85],
Student [rolNum=7, name=Charan, marks=85]]
2025-02-08T19:44:32.195+05:30  INFO 12104 --- [SpringJDBC] [ionShutdownHook] com.zaxxer.hikari.HikariDataSource       : HikariPool-1 - Shutdown initiated...
```

Only those two changes would be need apart from that there will be no modifications for any other file.