

Assignment: Database Connectivity using JDBC

Name: Mayur Ughade

Roll No: 21

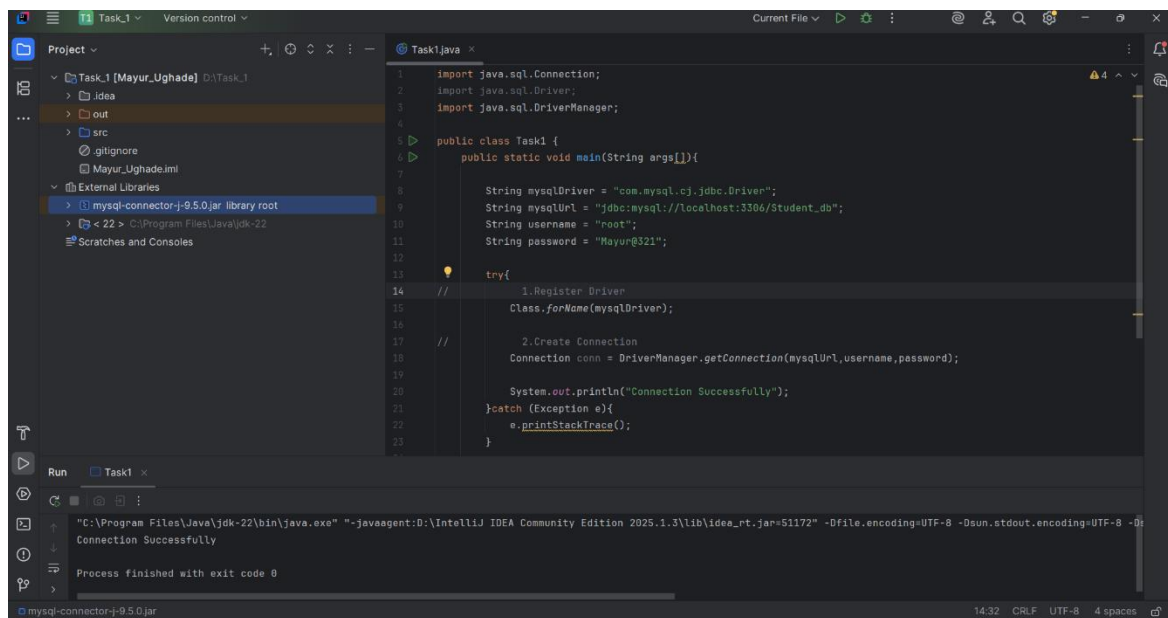
Task 1: Establishing Database Connection

File Name: Task1.java

1. Description

The objective of this task is to establish a connection between the Java application and the MySQL database Student_db. It utilizes the DriverManager class and the MySQL JDBC driver.

2. Source Code with output



```
1 import java.sql.Connection;
2 import java.sql.Driver;
3 import java.sql.DriverManager;
4
5 public class Task1 {
6     public static void main(String args[]){
7
8         String mysqlDriver = "com.mysql.cj.jdbc.Driver";
9         String mysqlUrl = "jdbc:mysql://localhost:3306/Student_db";
10        String username = "root";
11        String password = "Mayur@321";
12
13        try{
14            // 1.Register Driver
15            Class.forName(mysqlDriver);
16
17            // 2.Create Connection
18            Connection conn = DriverManager.getConnection(mysqlUrl,username,password);
19
20            System.out.println("Connection Successfully");
21        }catch (Exception e){
22            e.printStackTrace();
23        }
24    }
25 }
```

Run Task1

```
"C:\Program Files\Java\jdk-22\bin\java.exe" "-javaagent:D:\IntelliJ IDEA Community Edition 2025.1.3\lib\idea_rt.jar=51172" -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8 -D
Connection Successfully
Process finished with exit code 0
```

3. Execution Logic

- **Driver Loading:** Loaded `com.mysql.cj.jdbc.Driver` to communicate with the MySQL server.
- **Connection:** Established connection using URL `jdbc:mysql://localhost:3306/Student_db`.
- **Authentication:** Used username `root` and the specified password.

4. Verification

Connection Successfully

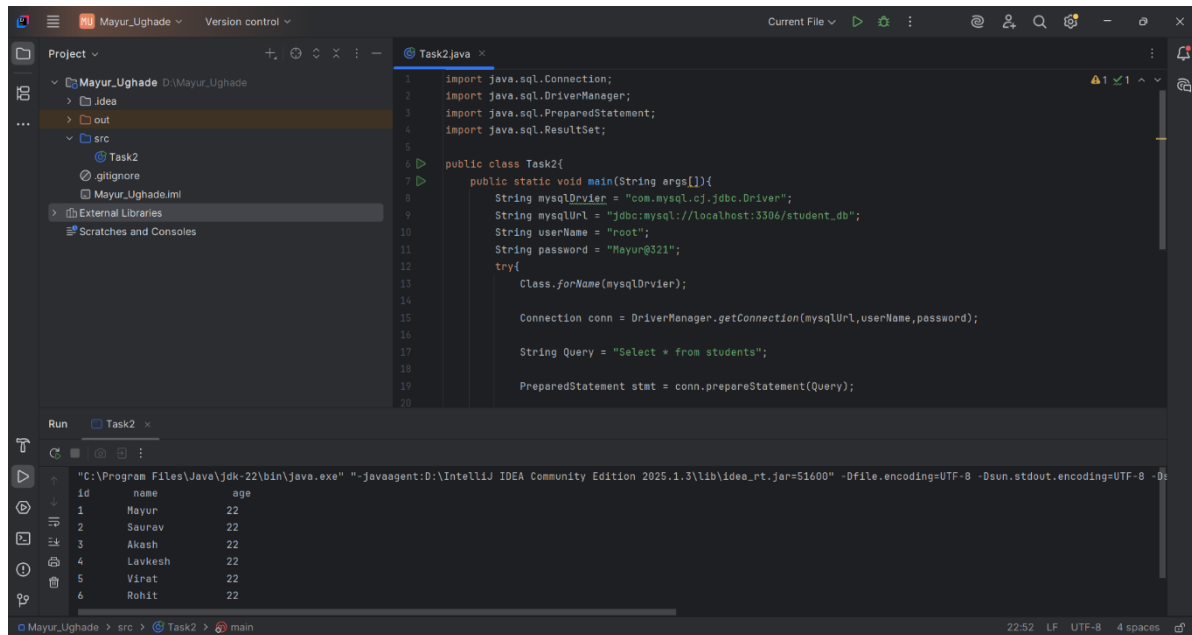
Task 2: Retrieving and Displaying Data

File Name: Task2.java

Description

This task focuses on fetching all records from the students table and displaying them in a formatted tabular manner in the Java console.

1. Source Code with output



The screenshot shows an IDE with a project named 'Mayur_Ughade'. The 'Task2.java' file is open, showing the following code:

```
1 import java.sql.Connection;
2 import java.sql.DriverManager;
3 import java.sql.PreparedStatement;
4 import java.sql.ResultSet;
5
6 public class Task2{
7     public static void main(String args[]){
8         String mysqlDriver = "com.mysql.cj.jdbc.Driver";
9         String mysqlUrl = "jdbc:mysql://localhost:3306/student_db";
10        String userName = "root";
11        String password = "Mayur@321";
12        try{
13            Class.forName(mysqlDriver);
14
15            Connection conn = DriverManager.getConnection(mysqlUrl,userName,password);
16
17            String Query = "Select * from students";
18
19            PreparedStatement stat = conn.prepareStatement(Query);
20        } catch (Exception e) {
21            e.printStackTrace();
22        }
23    }
24 }
```

The Run console shows the output of the program, displaying a table of student records:

```
id      name      age
1       Mayur     22
2       Saurav    22
3       Akash     22
4       Lavkesh   22
5       Viret    22
6       Rohit    22
```

2. Execution Logic

- **Query:** Executed `Select * from students`.
- **Loop:** Iterated through the `ResultSet` to print ID, Name, and Age.
- **Formatting:** Used tabs (`\t`) to align columns.

3. MySQL Verification

```
select * from student;
```

```
| id | name  | age |
```

```
|----|-----|-----|
```

```
| 1 | Mayur | 22 |
```

```
| 2 | Saurav | 22 |
```

```
| 3 | Akash  | 22 |
```

```
| 4 | Lavkesh | 22 |
```

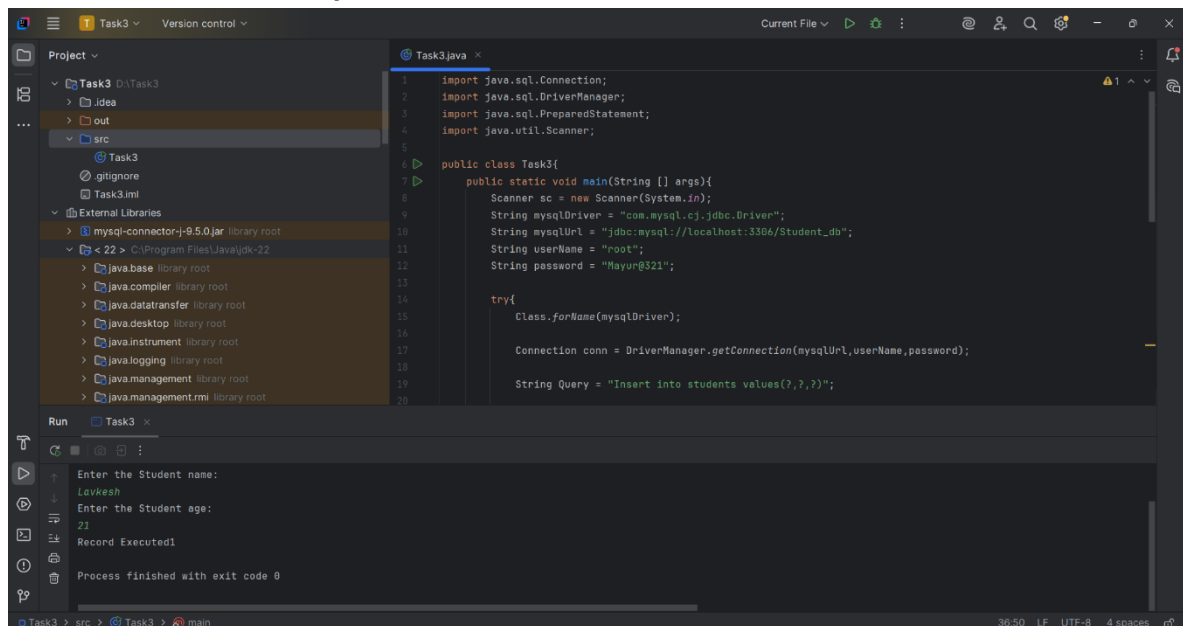
Task 3: Inserting Data into Database

File Name: Task3.java

1. Description

This task demonstrates how to accept user input (Name and Age) from the console and insert a new record into the student table using a PreparedStatement.

2. Source Code with output



The screenshot shows an IDE with the following components:

- Project View:** Shows the project structure with 'Task3' as the main module. It includes 'src' and 'out' directories, and a list of external libraries including 'mysql-connector-j-9.5.0.jar' and various Java standard library jars.
- Source Code:** The file 'Task3.java' is open, showing the following code:

```
1 import java.sql.Connection;
2 import java.sql.DriverManager;
3 import java.sql.PreparedStatement;
4 import java.util.Scanner;
5
6 public class Task3{
7     public static void main(String [] args){
8         Scanner sc = new Scanner(System.in);
9         String mysqlDriver = "com.mysql.cj.jdbc.Driver";
10        String mysqlUrl = "jdbc:mysql://localhost:3306/Student_db";
11        String userName = "root";
12        String password = "Mayur@321";
13
14        try{
15            Class.forName(mysqlDriver);
16
17            Connection conn = DriverManager.getConnection(mysqlUrl,userName,password);
18
19            String Query = "Insert into students values(?,?,?)";
20        }
21    }
22 }
```
- Run Console:** Shows the execution output:

```
Enter the Student name:
Lavkesh
Enter the Student age:
21
Record Executed:1
Process finished with exit code 0
```

3. Execution Logic

- **Input:** Scanner captured Name (Lavkesh) and Age (21).
- **Query:** Used `Insert into students values(?,?,?)`.
- **Security:** PreparedStatement used to handle inputs safely.

4. MySQL Verification

Enter the Student name: Lavkesh Enter the Student age: 21 Record Executed:1

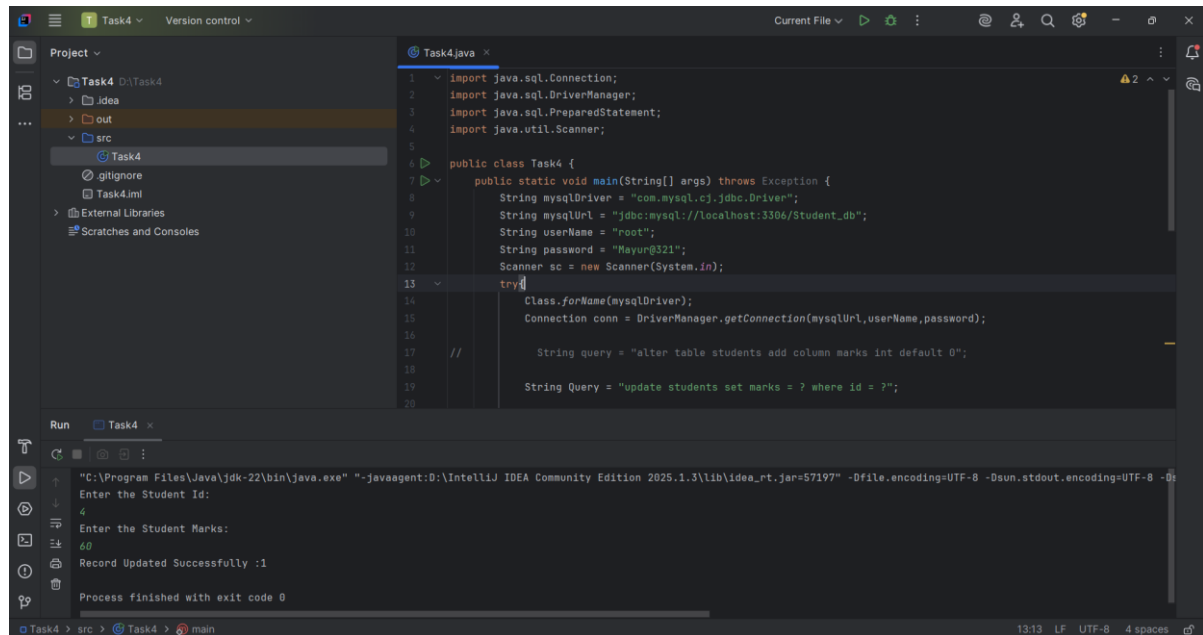
Task 4: Updating Existing Records

File Name: Task4.java

Description

This task performs an update operation. It first alters the table to add a marks column, then takes a Student ID and new Marks from the user to update the record.

1. Source Code with output



The screenshot displays the IntelliJ IDEA IDE. The left sidebar shows the project structure with 'Task4' selected. The main editor window shows the source code of 'Task4.java'. The code imports necessary Java classes and implements a 'main' method that connects to a MySQL database, alters the 'students' table to add a 'marks' column, and then updates a record based on user input. The 'Run' tab at the bottom shows the execution output, indicating that the record was updated successfully.

```
1 import java.sql.Connection;
2 import java.sql.DriverManager;
3 import java.sql.PreparedStatement;
4 import java.util.Scanner;
5
6 public class Task4 {
7     public static void main(String[] args) throws Exception {
8         String mysqlDriver = "com.mysql.cj.jdbc.Driver";
9         String mysqlUrl = "jdbc:mysql://localhost:3306/Student_db";
10        String userName = "root";
11        String password = "Mayur@321";
12        Scanner sc = new Scanner(System.in);
13        try {
14            Class.forName(mysqlDriver);
15            Connection conn = DriverManager.getConnection(mysqlUrl, userName, password);
16
17            // String query = "alter table students add column marks int default 0";
18
19            String Query = "update students set marks = ? where id = ?";
20        } catch (Exception e) {
21            e.printStackTrace();
22        }
23    }
24 }
```

Run Task4 x

```
"C:\Program Files\Java\jdk-22\bin\java.exe" "-javaagent:D:\IntelliJ IDEA Community Edition 2025.1.3\lib\idea_rt.jar=57197" -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8 -D
Enter the Student Id:
4
Enter the Student Marks:
60
Record Updated Successfully :1
Process finished with exit code 0
```

2. Execution Logic

Alter: alter table students add column marks int default 0.

Update: update students set marks = ? where id = ?.

Input: Updated Student ID 4 with Marks 60.

3. MySQL Verification

BEFORE UPDATION

select * from student;

id	name	age	marks
----	------	-----	-------

+-----+-----+-----+-----+

1	Saurav	21	0
---	--------	----	---

2	Mayur	20	0
---	-------	----	---

| 3 | Nikhil | 21 | 0 |

| 4 | Anand | 5 | 0 |

AFTER UPDATION

select * from student;

| id | name | age | marks |

+-----+-----+-----+-----+

| 1 | Saurav | 21 | 60 |

| 2 | Mayur | 20 | 0 |

| 3 | Nikhil | 21 | 0 |

| 4 | Anand | 5 | 0 |

| 5 | Akash | 21 | 0 |

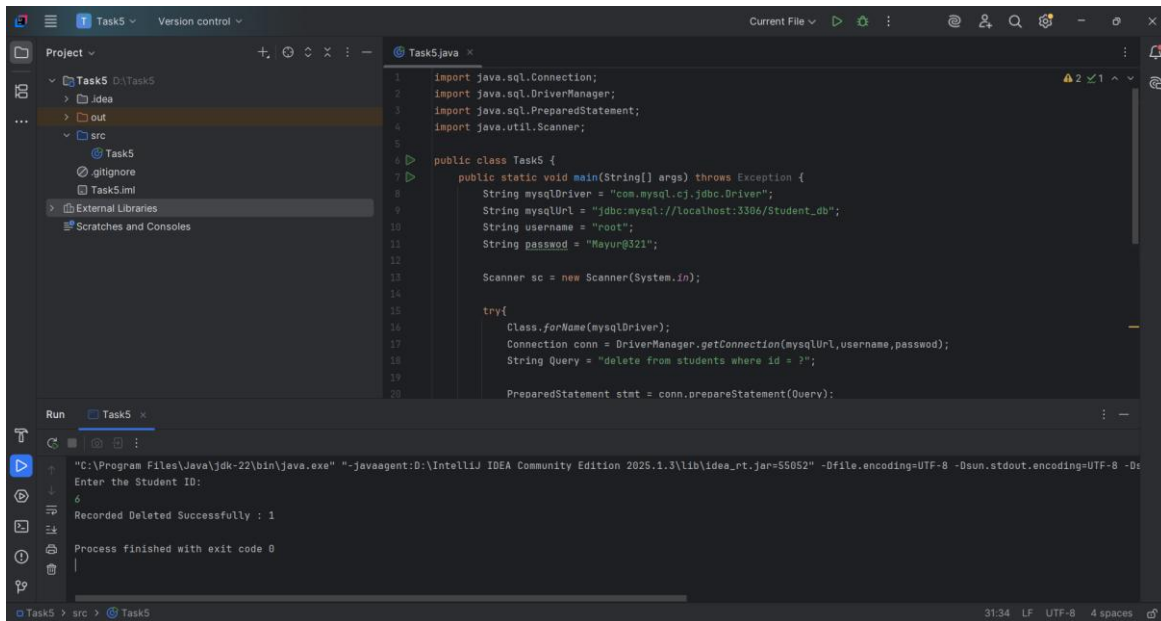
Task 5: Deleting Records from Database

File Name: Task5.java

1. Description

This task handles the removal of data. It prompts the user for a Student ID and deletes that specific record from the student table.

2. Source Code with output



The screenshot shows an IDE with the following content:

```
1 import java.sql.Connection;
2 import java.sql.DriverManager;
3 import java.sql.PreparedStatement;
4 import java.util.Scanner;
5
6 public class Task5 {
7     public static void main(String[] args) throws Exception {
8         String mysqlDriver = "com.mysql.cj.jdbc.Driver";
9         String mysqlUrl = "jdbc:mysql://localhost:3306/Student_db";
10        String username = "root";
11        String password = "Mayur@321";
12
13        Scanner sc = new Scanner(System.in);
14
15        try{
16            Class.forName(mysqlDriver);
17            Connection conn = DriverManager.getConnection(mysqlUrl,username,password);
18            String Query = "delete from students where id = ?";
19
20            PreparedStatement stmt = conn.prepareStatement(Query);
```

The Run console shows the following output:

```
"C:\Program Files\Java\jdk-22\bin\java.exe" "-javaagent:D:\IntelliJ IDEA Community Edition 2025.1.3\lib\idea_rt.jar=55052" -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8 -D...
Enter the Student ID:
6
Recorded Deleted Successfully : 1
Process finished with exit code 0
```

3. Execution Logic

- **Input:** The user provided Student ID 6.
- **Query:** delete from students where id = ?.
- **Result:** The record for Student ID 6 was permanently removed.

4. MySQL Verification

```
select * from student;
```

```
| id | name | age | marks |
```

```
+----+-----+-----+-----+
```

```
| 1 | Saurav | 21 | G0 |
```

```
| 2 | Mayur | 20 | 0 |
```

```
| 3 | Nikhil | 21 | 0 |
```

```
| 4 | Anand | 5 | 0 |
```