

- **Advanve_Java Task 2 :**

1. Code :

```
package com.connection;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.util.Scanner;

public class Student_DBconnection {

    public static void main(String[] args) {
        String url = "jdbc:oracle:thin:@localhost:1521:XE";
        String user = "system";
        String pass = "Vaishnavi";
        boolean flag=false;

        try{
            Class.forName("oracle.jdbc.OracleDriver");
            Connection con = DriverManager.getConnection(url, user, pass);
            PreparedStatement stmt=con.prepareStatement("select * from student");
            ResultSet rs =stmt.executeQuery();

            System.out.printf("%-5s %-15s %-30s %-5s%n",
                "ID", "NAME", "DEPARTMENT", "YEAR");
            System.out.println("-----");

            while (rs.next()) {
                System.out.printf("%-5d %-15s %-30s %-5d%n",
                    rs.getInt("id"),
                    rs.getString("name"),
                    rs.getString("department"),
                    rs.getInt("year"));
            }

            stmt.close();
            con.close();
        } catch (ClassNotFoundException e) {
            System.out.println(e.getStackTrace());
        } catch( Exception e) {
            e.printStackTrace();
        }
    }
}
```

2. Step by step Explaination :

1 Package Declaration

- Groups this class into the com.connection package.
- Helps in organizing JDBC-related classes.

2 Import Statements

- Connection** → Represents a connection with the database.
- DriverManager** → Manages database drivers and establishes connection.
- PreparedStatement** → Used to execute SQL queries securely.
- ResultSet** → Stores data returned from the database.
- Scanner** → Used for user input (not used in this program).

3 Class Declaration

```
public class Student_DBconnection {
```

- Defines a public class named Student_DBconnection.

4 Main Method

- Entry point of the Java program.
- Execution starts from here.

5 Database Configuration

- url** → Oracle JDBC connection URL
 - localhost → Database server
 - 1521 → Oracle port number
 - XE → Oracle Express Edition
- user** → Database username
- pass** → Database password

6 Load Oracle JDBC Driver

- Loads the Oracle JDBC driver into memory.
- Required to enable Java–Oracle communication.

7 Establish Database Connection

- Connects Java application to Oracle database.
- Returns a Connection object.

8 Create PreparedStatement

- Prepares SQL query to fetch all records from student table.
- More secure and efficient than Statement.

9 Execute Query

- Executes the SQL query.
- Stores the result in a ResultSet object.

[10] Print Table Header (Formatted Output)

- `printf()` → Used for formatted output.
- `%-5s` → Left-aligned string with width 5
- `%-15s` → Left-aligned string with width 15
- `%n` → New line

[1] [1] Print Separator Line

```
System.out.println("-----");
```

- Visually separates header from data rows.

[1] [2] Read Data from ResultSet

```
while (rs.next()) {
```

- Moves row by row through the database records.
- ```
 System.out.printf("%-5d %-15s %-30s %-5d%n",
 rs.getInt("id"),
 rs.getString("name"),
 rs.getString("department"),
 rs.getInt("year"));
```
- Retrieves column values:
  - Displays them in tabular format.

## **[1] [3] Close Resources**

- Frees database resources.
- Prevents memory leaks.

## **[1] [4] Exception Handling**

### **Driver Not Found**

- Occurs if Oracle JDBC driver is missing.

### **SQL or Other Errors**

- Handles SQL errors, connection issues, etc.

### **Note:**

- Make sure the Oracle JDBC driver (e.g. ojdbc8.jar) is added to your project's classpath.
- If you get `ClassNotFoundException` the driver JAR is missing.
- If you get `SQLException`: No suitable driver check the URL format and driver jar.

### 3.Ouput Screenshot :

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project View:** Shows the project structure under "Adv\_Java".
- Main.java:** Contains the code for the `Student_DBconnection` class.
- Run Tab:** Shows the command used to run the program: `"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:E:\IntelliJ IDEA Community Edition 2025.1.3\lib\idea_rt.jar=53254" -Dfile.encoding=UTF-8`.
- Output Window:** Displays the program's output:

```
ID NAME DEPARTMENT YEAR

1 Vaishnavi Computer Science 1
2 Maurii Information Technology 3
3 Siddhi Metullargy 2
4 Aditi Computer Science 2
5 Mahesh Mechanical 1

Process finished with exit code 0
```
- Status Bar:** Shows the current time as 39:33, file encoding as CRLF, and other system information like weather and battery status.