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EXPERIMENT – 5(Project Based Learning with Java)

Q1)

CODE JAVA

```
package Wrap;

import java.sql.*;
import java.util.Scanner;

public class Students5exp {
   private static final String URL = "jdbc:mysql://localhost:3306/Employee_rec";
   private static final String USER = "root";
   private static final String PASSWORD = "Golmol@123";
   private Connection connection;
   private Scanner scanner;

   // Constructor: Connect to Database
   public Students5exp() {
      try {
         Class.forName("com.mysql.cj.jdbc.Driver");
         connection = DriverManager.getConnection(URL, USER, PASSWORD);
         System.out.println(" Database Connected Successfully!");
      } catch (ClassNotFoundException e) {
         System.err.println("JDBC Driver not found! Add MySQL Connector JAR.");
         e.printStackTrace();
      } catch (SQLException e) {
         System.err.println("Database Connection Failed! Check Credentials.");
         e.printStackTrace();
      }
      scanner = new Scanner(System.in);
   }

   // Fetch all employees
   public void getAllEmployees() {
      String query = "SELECT * FROM Employees";
      try (Statement stmt = connection.createStatement();
           ResultSet rs = stmt.executeQuery(query)) {
         System.out.println("\nEmployee List:");
         if (!rs.isBeforeFirst()) {
            System.out.println("No employees found!");
            return;
         }
         while (rs.next()) {
            System.out.println("ID: " + rs.getInt("id") +
                  " | Name: " + rs.getString("name") +
                  " | Salary: " + rs.getDouble("salary"));
         }
      } catch (SQLException e) {
         System.err.println("Error fetching employees: " + e.getMessage());
      }
   }

   // Insert an employee
   public void addEmployee(String name, double salary) {
      String query = "INSERT INTO Employees (name, salary) VALUES (?, ?)";
      try (PreparedStatement stmt = connection.prepareStatement(query)) {
         stmt.setString(1, name);
         stmt.setDouble(2, salary);
         stmt.executeUpdate();
         System.out.println(" Employee added successfully!");
      } catch (SQLException e) {
```

```
            System.err.println("Error adding employee: " + e.getMessage());
        }
    }

    // Remove duplicate employees based on name and salary
    public void removeDuplicateEmployees() {
        String query = "DELETE e1 FROM Employees e1 " +
                "INNER JOIN Employees e2 " +
                "ON e1.name = e2.name AND e1.salary = e2.salary " +
                "WHERE e1.id > e2.id";
        try (Statement stmt = connection.createStatement()) {
            int rowsDeleted = stmt.executeUpdate(query);
            System.out.println(rowsDeleted + " duplicate records removed.");
        } catch (SQLException e) {
            System.err.println("Error removing duplicates: " + e.getMessage());
        }
    }

    // Close connection
    public void closeConnection() {
        if (connection != null) {
            try {
                connection.close();
                System.out.println(" Database Connection Closed.");
            } catch (SQLException e) {
                System.err.println("Error closing connection: " + e.getMessage());
            }
        }
    }

    // Start the menu-driven system
    public void startMenu() {
        while (true) {
            System.out.println("\n======= Employee Management System =======");
            System.out.println("1. Add Employee");
            System.out.println("2. Display All Employees");
            System.out.println("3. Remove Duplicate Employees");
            System.out.println("4. Exit");
            System.out.print("Choose an option: ");

            int choice;
            try {
                choice = Integer.parseInt(scanner.nextLine());
            } catch (NumberFormatException e) {
                System.out.println("Invalid input! Please enter a number.");
                continue;
            }

            switch (choice) {
                case 1:
                    addEmployeeMenu();
                    break;
                case 2:
                    getAllEmployees();
                    break;
                case 3:
                    removeDuplicateEmployees();
                    break;
                case 4:
                    System.out.println("Exiting Employee Management System...");
                    closeConnection();
                    scanner.close();
                    System.exit(0);
                    break;
```

```
            default:

                System.out.println("Invalid choice! Please enter 1, 2, 3, or 4.");
            }
        }
    }

    // Menu for Adding Employee
    private void addEmployeeMenu() {
        System.out.print("Enter Employee Name: ");
        String name = scanner.nextLine();

        double salary;
        while (true) {
            System.out.print("Enter Employee Salary: ");
            try {
                salary = Double.parseDouble(scanner.nextLine());
                break;
            } catch (NumberFormatException e) {
                System.out.println("Invalid salary input! Please enter a valid number.");
            }
        }

        addEmployee(name, salary);
    }

    // Main method
    public static void main(String[] args) {
        Students5exp db = new Students5exp();
        db.startMenu();
    }
}
```

MY SQL _Code:

```
CREATE DATABASE Employee_rec;
USE Employee_rec;
CREATE TABLE Employees (
 id INT AUTO_INCREMENT PRIMARY KEY,
 name VARCHAR(100) NOT NULL,
 salary DECIMAL(10,2) NOT NULL
);
select * from Employees;
```

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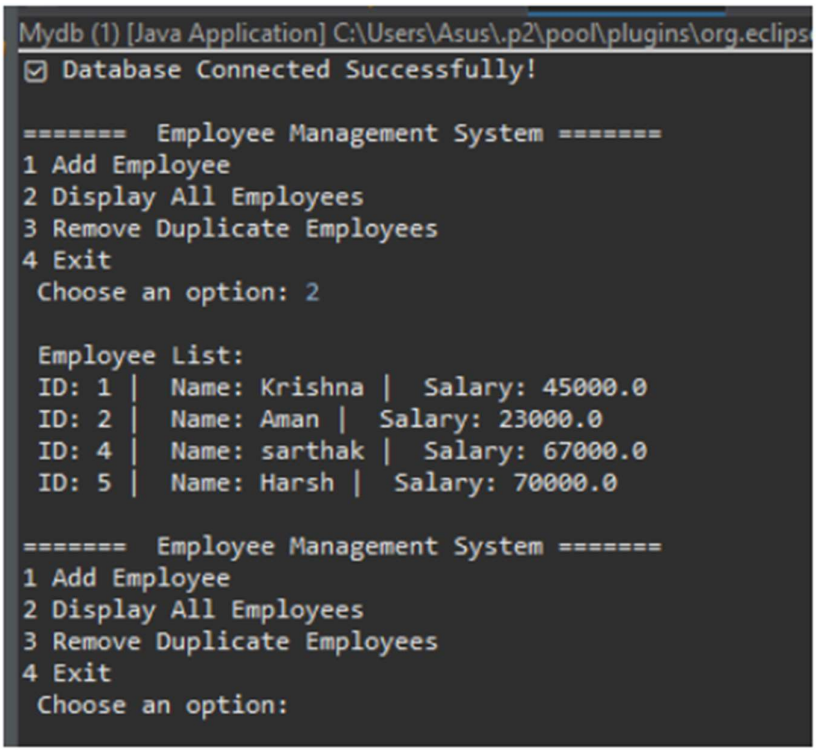
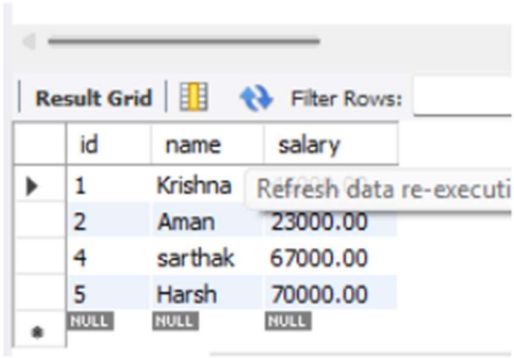
Output:





Q2)
Code:

```
package Wrap;
import java.util.*;

public class Autoboxing {
   public static void main(String[] args) {
      List<String> numberStrings = Arrays.asList("10", "20", "30", "40", "50");
      List<Integer> numbers = new ArrayList<>();

      for (String numStr : numberStrings) {
         numbers.add(parseToInteger(numStr));
      }

      int sum = calculateSum(numbers);
      System.out.println("Sum of numbers: " + sum);
```

```
    }

    private static Integer parseToInteger(String str) {
        return Integer.parseInt(str);
    }

    private static int calculateSum(List<Integer> numbers) {
        int sum = 0;
        for (Integer num : numbers) {
            sum += num;
        }
        return sum;
    }
}
```

OUTPUT