

Java Database Connectivity and SQL

Objective: Write a Java program that interacts with a database using SQL.

Requirements:

- Create a new Java class that represents a database connection.
- Use the `Connection` class to establish a connection to the database.
- Use SQL queries to create, read, update, and delete data in the database.

Optional/Bonus Exercises:

- Write a Java program that simulates a simple library management system with a database.
- Write a Java program that simulates a simple e-commerce system with a database.

Hint: Here is an example code snippet to get you started:

```
// DatabaseConnection.java
import java.sql.*;

public class DatabaseConnection {
    public static void main(String[] args) {
        String url = "jdbc:mysql://localhost:3306/mydatabase";
        String user = "root";
        String password = "password";

        try (Connection connection =
            DriverManager.getConnection(url, user, password)) {
            System.out.println("Connected to the database");

            Statement statement = connection.createStatement();

            // Create table
            String createTableSQL =
                "CREATE TABLE IF NOT EXISTS users
                (id INT AUTO_INCREMENT PRIMARY KEY, name VARCHAR(50),
                email VARCHAR(50))";
            statement.execute(createTableSQL);

            // Insert data
            String insertDataSQL =
                "INSERT INTO users (name, email) VALUES
                ('John Doe', 'john.doe@example.com')";
            statement.executeUpdate(insertDataSQL);

            // Read data
            String readDataSQL = "SELECT * FROM users";
            ResultSet resultSet = statement.executeQuery(readDataSQL);
```

```

        while (resultSet.next()) {
            System.out.println("ID: "
                + resultSet.getInt("id"));
            System.out.println("Name: "
                + resultSet.getString("name"));
            System.out.println("Email: "
                + resultSet.getString("email"));
        }

        // Update data
        String updateDataSQL = "UPDATE users
            SET email='john.new@example.com'
            WHERE name='John Doe'";
        statement.executeUpdate(updateDataSQL);

        // Delete data
        String deleteDataSQL = "DELETE FROM users
            WHERE name='John Doe'";
        statement.executeUpdate(deleteDataSQL);

    } catch (SQLException ex) {
        ex.printStackTrace();
    }
}

```