CSCI-C212 - Assignment 6: Building a Java Swing GUI for Tom's Garage

Purpose: This assignment will allow students to apply Java Swing components and understand event handling. This assignment will reinforce and practice encapsulation and inheritance principles, and object-oriented programming concepts in a practical scenario.

Assignment Description

Tom, the automobile enthusiast, needs an application to organize the vehicles in his garage. You will create a Java Swing GUI that lets Tom enter information about various types of vehicles and display details about each one.

The application should have the following features:

1. **Vehicle Entry Form**
   - Create a form where Tom can input information about each vehicle, including:
     - Vehicle type (Car, Truck, Motorcycle)
     - Make (e.g., Toyota, Ford)
     - Model (e.g., Corolla, Mustang)
     - Year
     - Mileage
   - Use text fields, dropdowns (JComboBox), and buttons to design this form.
2. **Add and Display Vehicles**
   - Add a button labeled "Add Vehicle" to save the entered vehicle details to Tom's collection.
   - Display a list of added vehicles in a separate area using a JTextArea or JList.
   - Each time a vehicle is added, it should appear in this list.
3. **Additional Functionalities**
   - A button to remove a selected vehicle from Tom's list.
   - A button to clear the form fields after each entry.

Requirements

1. **GUI Components:**
   - Use JPanel, JFrame, JButton, JLabel, JTextField, JComboBox, and JTextArea.
   - Arrange components in a user-friendly layout.
2. **Object-Oriented Design:**
   - Create a `Vehicle` superclass and specific subclasses (`Car`, `Truck`, `Motorcycle`).
   - Use constructors to initialize object properties and override methods where necessary.
3. **Error Handling:**
   - Ensure that all required fields are filled before adding a vehicle.
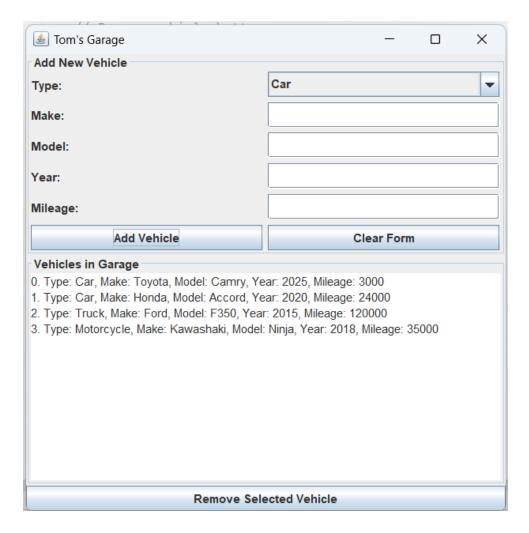   - Display an error message if any input is invalid or missing.
4. **Submission:**

- A zip file containing the Java project folder.
- Include screenshots showing the working GUI in your zip file.

Sample Interface:

The interface could look something like this:

1. **Top Section:** Form with labels and fields for input.
2. **Middle Section:** "Add Vehicle" and "Clear Form" buttons.
3. **Bottom Section:** List or display area of all added vehicles with the "Remove Vehicle" button.

Evaluation Criteria:

See the assignment rubric.