

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.

The screenshot shows a Java Swing window titled "Tom's Garage". The window is divided into three main sections. The top section, titled "Add New Vehicle", contains a form with five input fields: "Type" (a dropdown menu currently showing "Car"), "Make", "Model", "Year", and "Mileage". Below these fields are two buttons: "Add Vehicle" and "Clear Form". The middle section, titled "Vehicles in Garage", contains a list box displaying four vehicles: 0. Type: Car, Make: Toyota, Model: Camry, Year: 2025, Mileage: 3000; 1. Type: Car, Make: Honda, Model: Accord, Year: 2020, Mileage: 24000; 2. Type: Truck, Make: Ford, Model: F350, Year: 2015, Mileage: 120000; 3. Type: Motorcycle, Make: Kawasaki, Model: Ninja, Year: 2018, Mileage: 35000. The bottom section contains a single button labeled "Remove Selected Vehicle".

Evaluation Criteria:

See the assignment rubric.