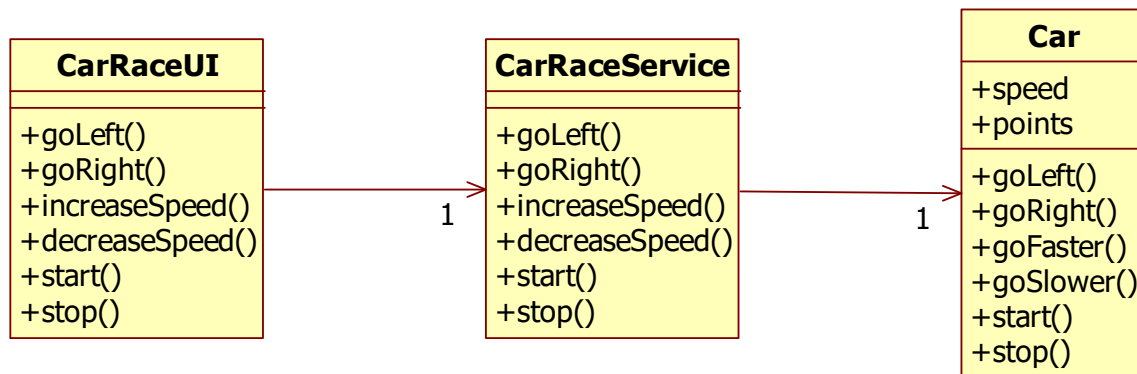


Design question 2

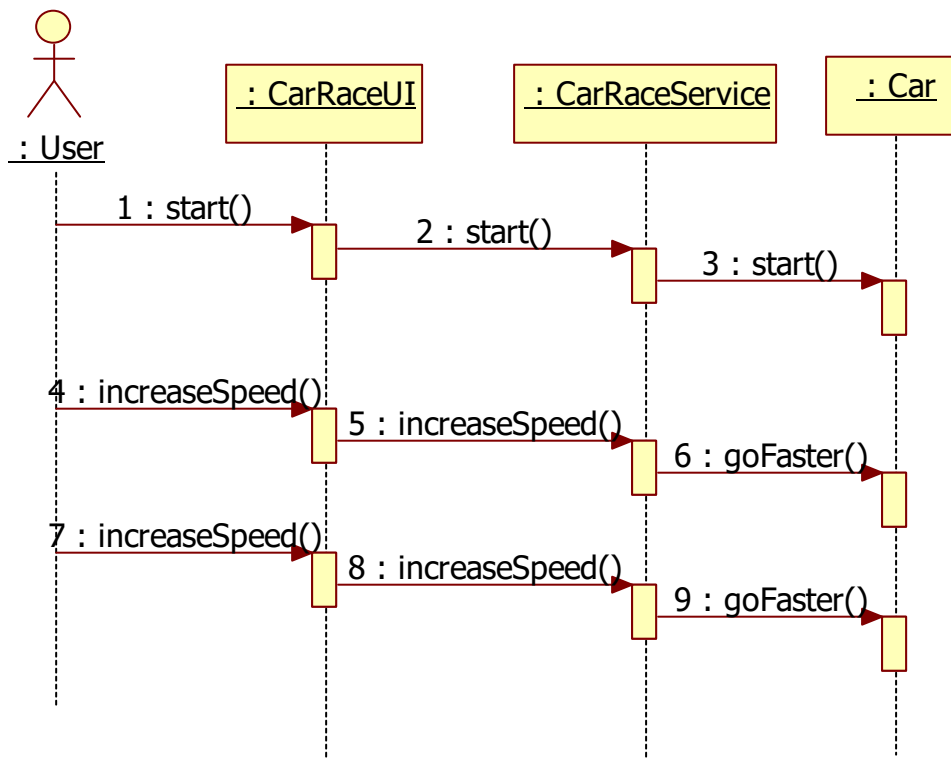
Suppose you need to design a framework for a simple car racing game with the following requirements:

- The user can do the following actions: go left, go right, increase speed and decrease speed.
- The user gets points for how well it stays on the road, and how fast it can race.

For this question we will only focus on the Car, and the actions on the Car. Suppose we have the following **partial** class diagram of the framework:



The sequence diagram of a possible scenario looks like this:



Now suppose we get a new requirements for the framework:

1. The framework should also support undo and redo functionality for the actions **increaseSpeed()** and **decreaseSpeed()**. This means the CarRaceUI class gets 2 more buttons: an **undo** button and a **redo** button.
2. The framework should support different car modes. The modes supported by the framework are:
 - a) Rookie Racer: This means you have less than 1000 points, and if you press the increaseSpeed button, your speed is increased with 1 mile per hour. If you press the decreaseSpeed button, your speed is decreased with 1 mile per hour
 - b) Racer: This means you have between 1000 and 5000 points, and if you press the increaseSpeed button, your speed is increased with 2 miles per hour. If you press the decreaseSpeed button, your speed is decreased with 2 miles per hour
 - c) Pro Racer: This means you have more than 5000 points, and if you press the increaseSpeed button, your speed is increased with 3 miles per hour. If you press the decreaseSpeed button, your speed is decreased with 3 miles per hour

Changes in speed is calculated and then shown

If the car has enough points, it will automatically be upgraded to the next node. The car can only be upgraded to a higher mode if the goFaster() or goSlower() method is called on the Car.

It should be easy to write racing applications using the framework that support different car modes.

3. The framework should also support the following:
 - a) When we start the game by pressing the start button on the CarRaceUI, the car speed and number of points is loaded from the database. When we stop the game, the car speed and number of points is stored in the database.
 - b) In the racing game, we want to show all kind of car information (speed, points, current user action) on the screen in different window frames. The user can then choose which window frames will be shown on the screen. The framework should support the following window frames:
 1. A window that shows the current speed of the car
 2. A window that shows the number of points
 3. A window that shows the last user action

It should be easy to write racing applications using the framework that support different window frames, for example a window that shows both the speed and the points next to each other.

Draw the class diagram of your design. In a sequence diagram, show how your design works