


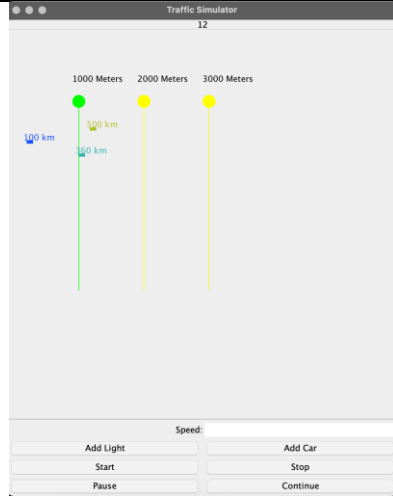
Project 3

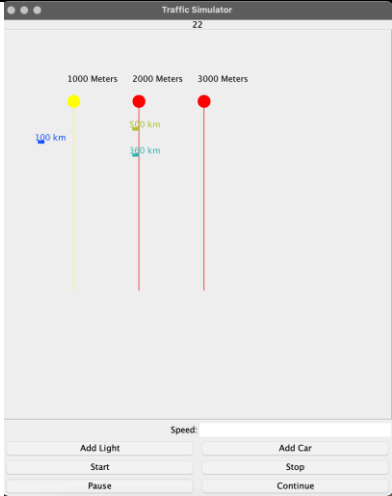
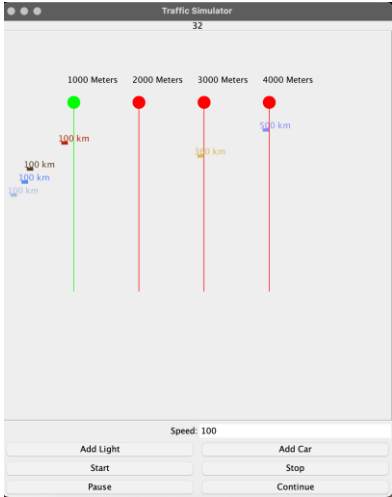

Seyedehnafiseh Beikabadi
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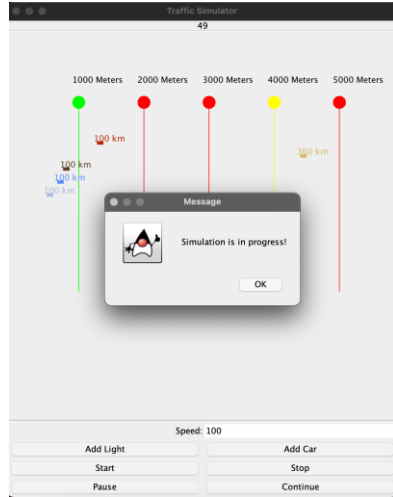
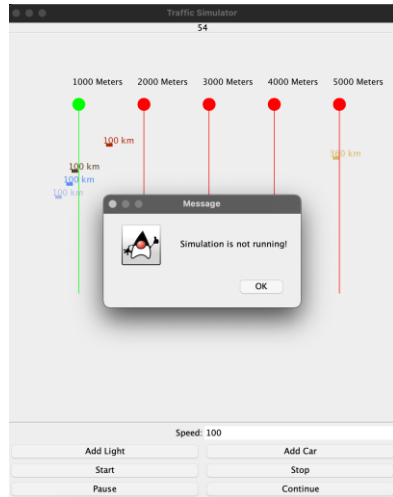
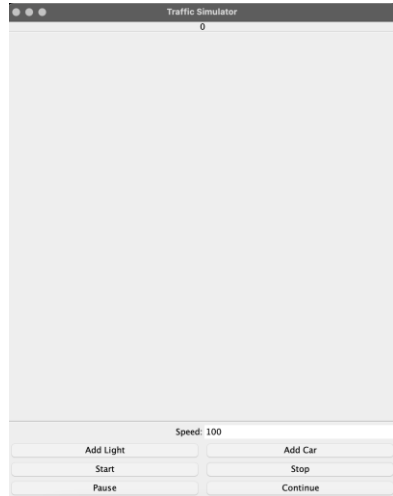
7382 Object-Oriented and Concurrent

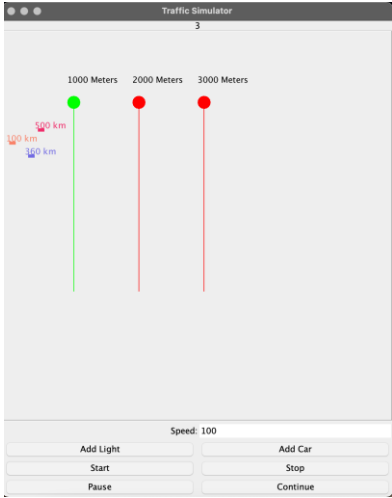
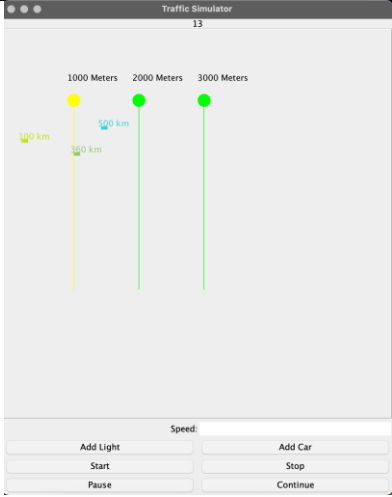
(2208) Professor: Amanda Yu
Due Dec 15, 2020 11:59 PM

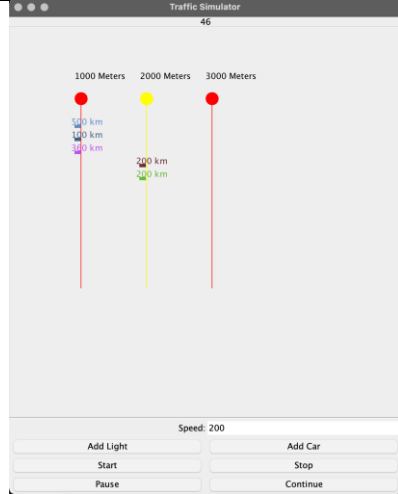


Test plan:

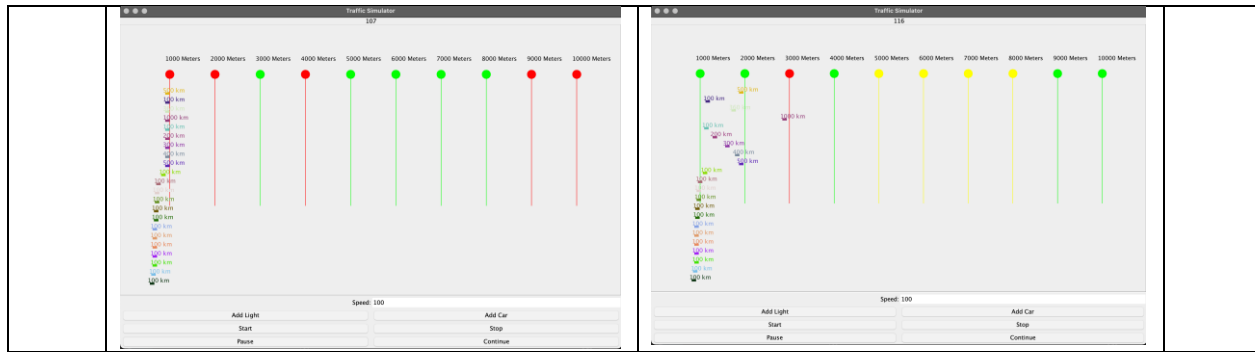
Test Case	Input	Output	Pass ?
1	Run the program	 The screenshot shows a window titled "Traffic Simulator" with a timer at 9. The main area has three vertical lines representing distances: 1000 Meters, 2000 Meters, and 3000 Meters. A red dot is at the 1000 Meters mark, and a blue car icon is at the 100 km mark. Below the lines are buttons for "Add Light", "Start", "Pause", "Add Car", "Stop", and "Continue". A "Speed:" label is also present.	Yes
2	After 12 second Paused the program	 The screenshot shows the same "Traffic Simulator" window but with a timer at 12. The red dot at 1000 Meters has changed to a yellow dot. The blue car icon is still at the 100 km mark. The buttons and "Speed:" label remain the same.	Yes
3	Stop behind red light		Yes

			
4	Add 3 cars with same speed but different time		Yes
5	Add two traffic light		Yes

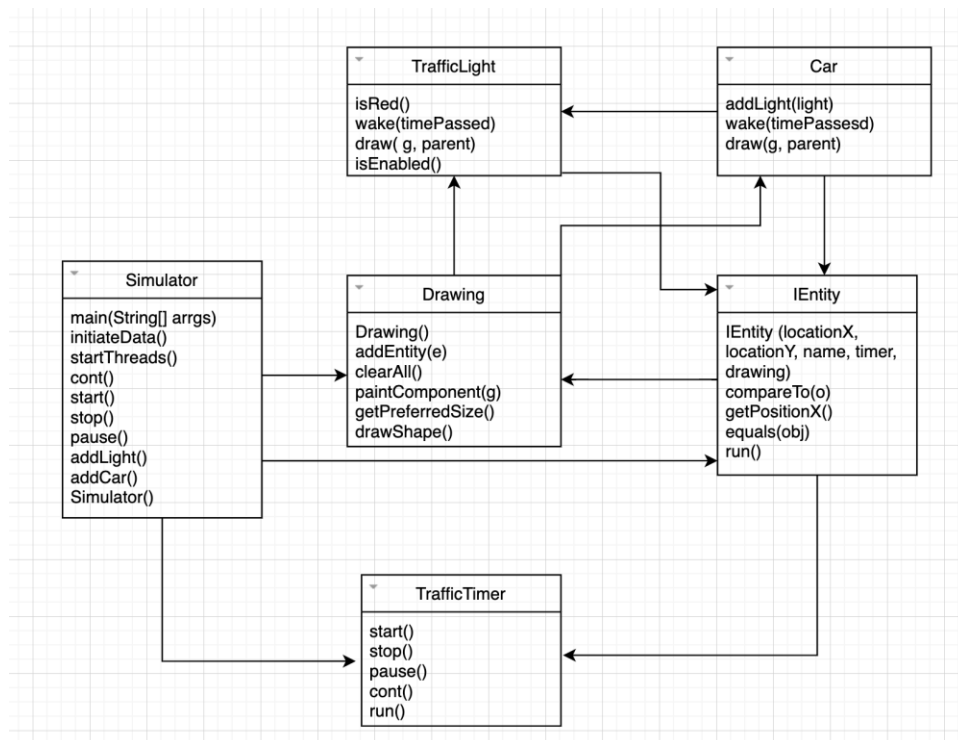
6	When program is in progress click start	 <p>The screenshot shows the 'Traffic Simulator' window with a score of 49. A message box titled 'Message' is displayed in the center, stating 'Simulation is in progress!' with an 'OK' button. The background interface includes a road with five colored dots (green, red, red, yellow, red) at 1000, 2000, 3000, 4000, and 5000 meters. Below the road, there are buttons for 'Add Light', 'Add Car', 'Start', 'Stop', 'Pause', and 'Continue', along with a 'Speed: 100' indicator.</p>	Yes
7	When the program is paused click pause again	 <p>The screenshot shows the 'Traffic Simulator' window with a score of 54. A message box titled 'Message' is displayed in the center, stating 'Simulation is not running!' with an 'OK' button. The background interface is identical to the previous screenshot, showing the road with colored dots and control buttons.</p>	Yes
8	Click on Stop	 <p>The screenshot shows the 'Traffic Simulator' window with a score of 0. The 'Stop' button is highlighted with a red border. The background interface shows the road with colored dots and other control buttons.</p>	Yes

9	Click on Start		Yes
10	Passing cars through green light and yellow light		Yes

11	Add two cars at the same time and with the same speed		Yes
12	10 traffic lights with the random status		Yes
13	Add a number of cars		Yes
14	(Time: 107)	(Time: 116 (After 9 second))	Yes



UML Diagram:



user's Guide:

To run this application, you can simply use any Java IDE or even command line. I used Visual Studio Code to write and run this application. All the rules of the simulation are based on the project description. There is a 1000-meter distance between every two traffic lights and cars only stop at the red light. The timer at the top is counting seconds. All buttons in this application are working as described in the project description.

Lessons learned:

In this project, I learned how to deal with challenges in parallel programming. Especially when we have several threads that are using the same timer as the source of truth. Also, it was very challenging to debug a code that has more than one thread, more specifically dependency between objects that belonged to different threads made it very interesting project.