TRAFFIC SIMULATOR TEST PLAN

This is the plan for testing of the Traffic Simulator software

Huy Vuong

Mohammad Majid

Bryan Chavez

Brian Nguyen

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1. Introduction

In this report, we will demonstrate the use of testing to software development. Simulation will be tested using several different python testing modules, namely **pytest**, **unittest** and **doctest**. Since this software is a GUI application, both Unit test, functional test and behavioral test

2. System Overview

The software is built based on Object Oriented Programming Principles (OOP), therefore it will also be tested using OOP principles.

3. Features to be Tested

Testing Requirement	Short description
1	Car is able to travel from one place to designated destination using some type of data structure and algorithm
2	Car will travel 15 mph for the first ⅛ mile and 30mph thereafter until it stops.
3	User establishes start and end destination
4	When user selects start, simulation begins.
5	Car will stop after it reaches destination.
6	Car stops at a stop sign 3 steps
7	Car stops at traffic light when red fo 3 steps

4. Test Environment

- Py modules needed : **pytest, unittest, doctest**
- Environment : **pytest**
- Execution : **python3, shellscript,**

5. Test Cases

5.1. Test Case 0

- Component under test: Raw
- Feature(s) to be tested: 1
- Initial Conditions:
    - N/A
- Expected Behavior:
    - Input:

      Tiles.wall in raw_map
      Tiles.road in raw_map
      Tiles.car_right in raw_map
      Tiles.car_left in raw_map
      Tiles.car_down in raw_map
      Tiles.car_up in raw_map
      Tiles.traffic_lights in raw_map

    - Expected output:

      True
      True
      True
      True
      True
      True
      True

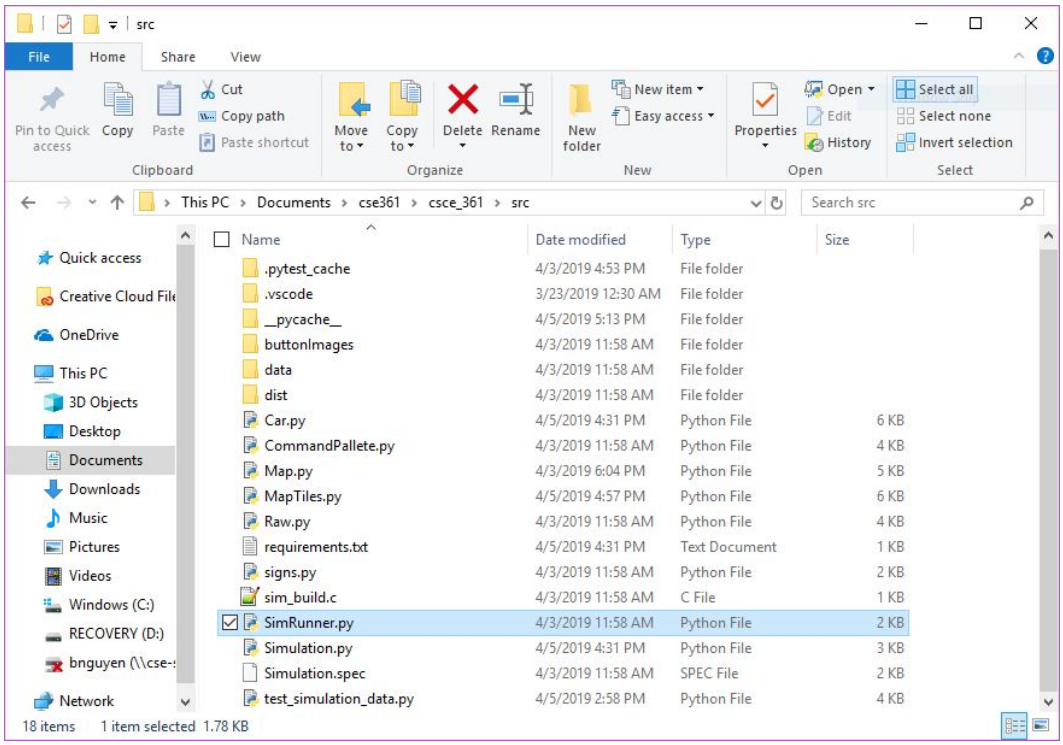
5.1. Test Case 1:

- Component under test: Car, Map, Simulation
- Feature(s) to be tested: 1, 2, 3, 4, 5
- Initial Conditions:
    - There are cars in the Map
    - Roads are available in ideal condition (no broken road, no dead end…)
- Expected Behavior:
    - Input:
        - car = Car(Point(5, 8), Tiles.car_left, master=m.city, dest=Point(8,8))
        - Map.optimal_path(car)
    - Expected output:

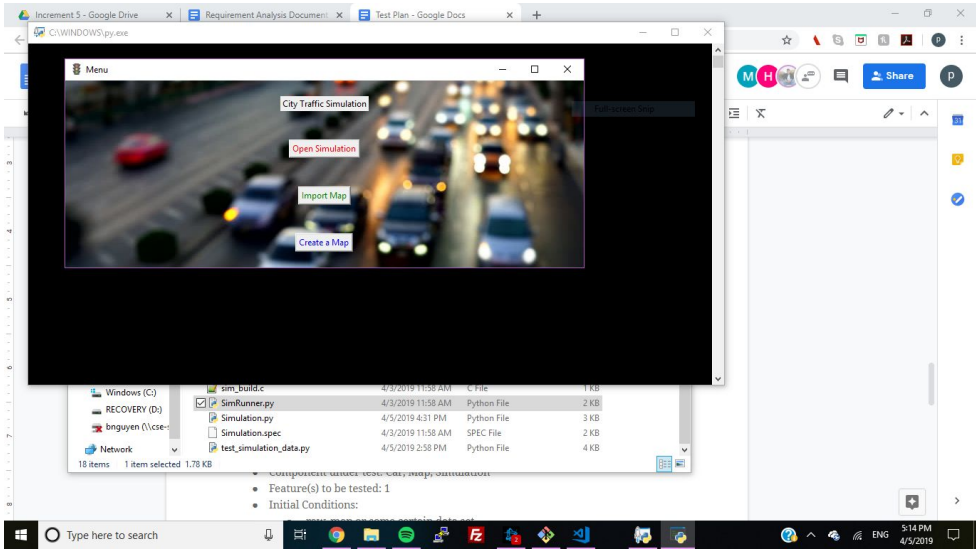
        - [Point(5,8), Point(6,8), Point(7, 8), Point(8,8)]

5.1. Test Case 2:

- Component under test: Car, Map, Simulation
- Feature(s) to be tested: 4, 5
- Initial Conditions:
    - Simulation File
- Expected Behavior:
    - Input:
        - Double Click on the simulation runner file

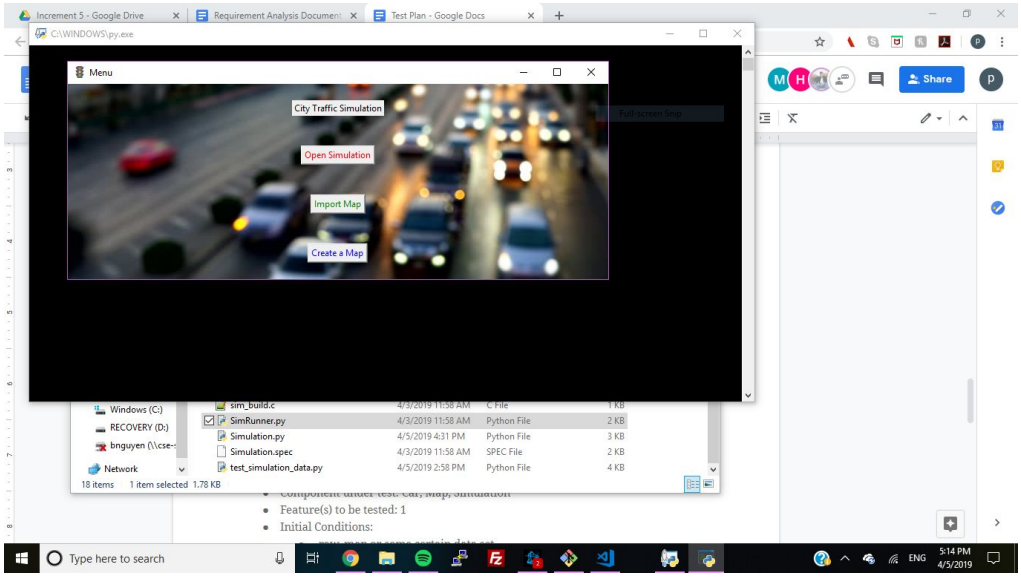


    - Expected output:
        - First window of Simulation opens

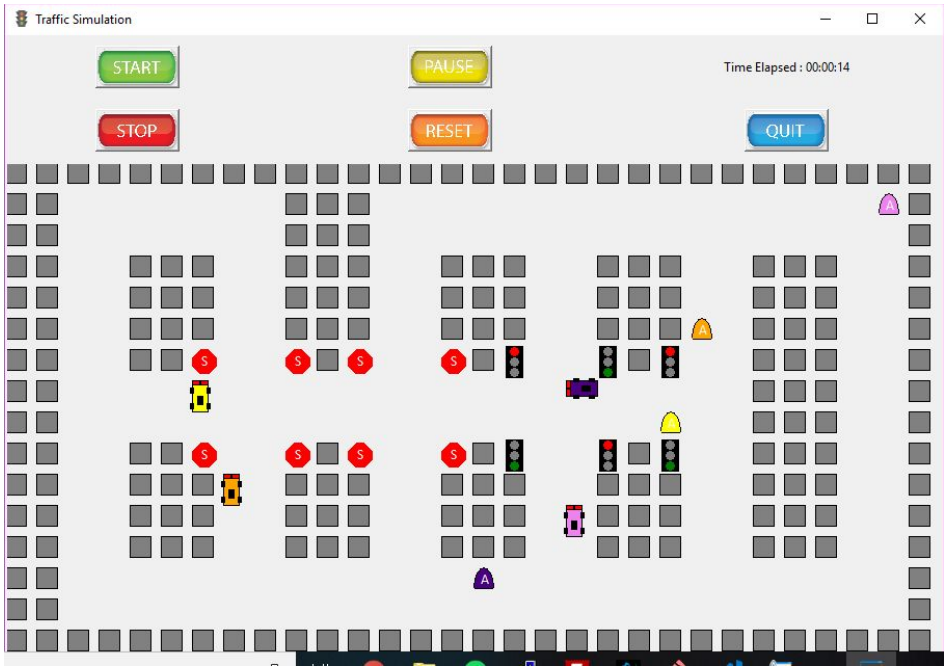


5.1. Test Case 3:

- Component under test: Car, Map, Simulation
- Feature(s) to be tested: 3
- Initial Conditions:
    - First window of Simulation is open
- Expected Behavior:
    - Input
        - Click on Open Simulation Button



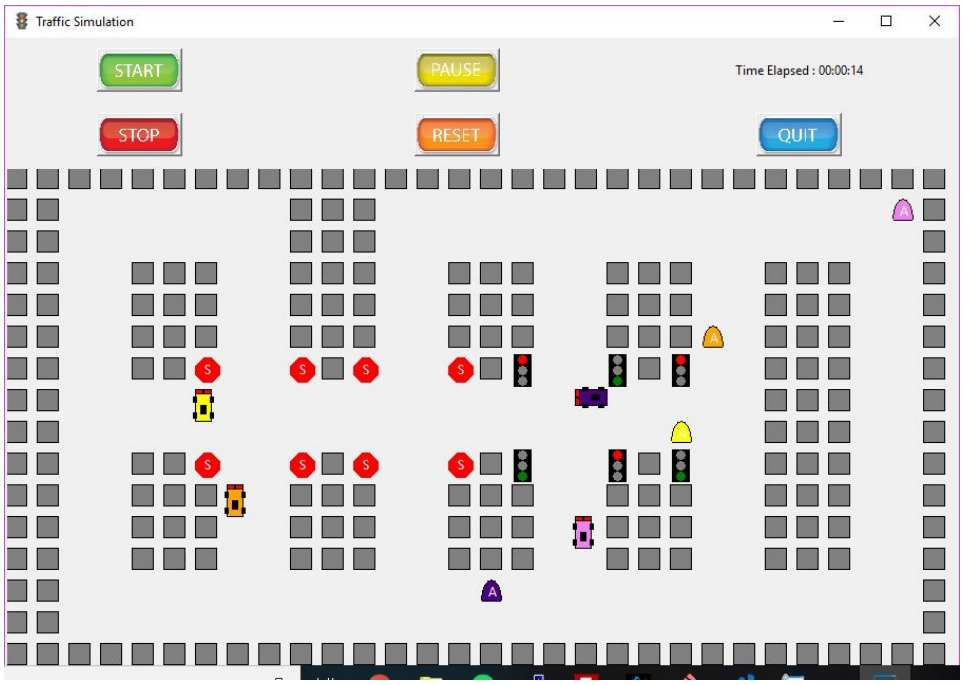
- Expected output
  - Simulation Opens along with Map, cars, traffic features and destinations



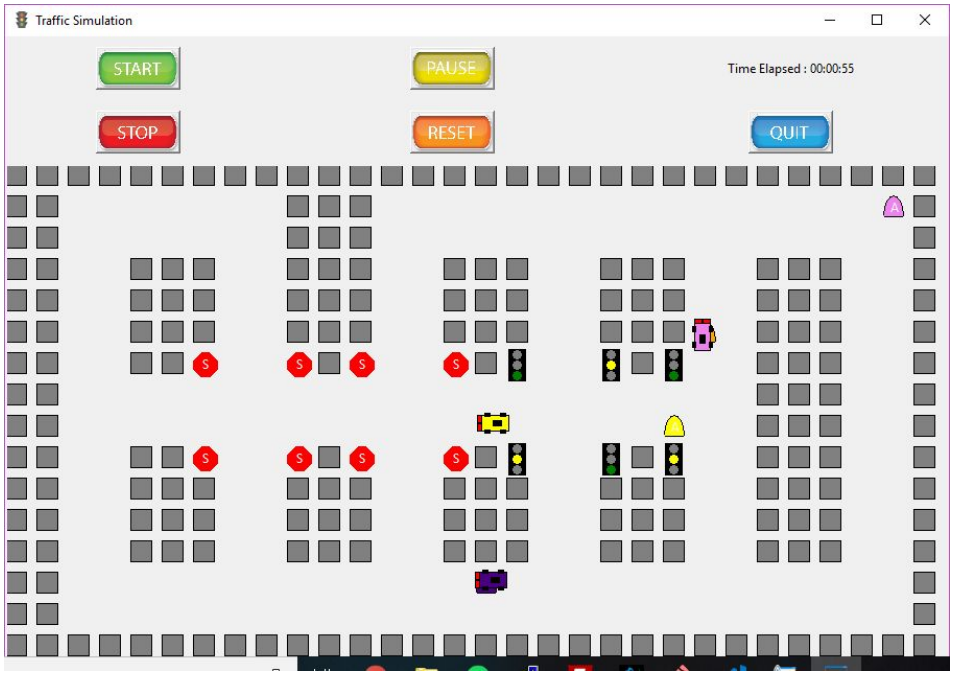
5.1. Test Case 4:

- Component under test:

- Feature(s) to be tested: 1,2,3,4,5,6,7
- Initial Conditions:
    - Simulation Open with Map, Cars, Traffic features, and destination
- Expected Behavior:
    - Input: Click on Start Button

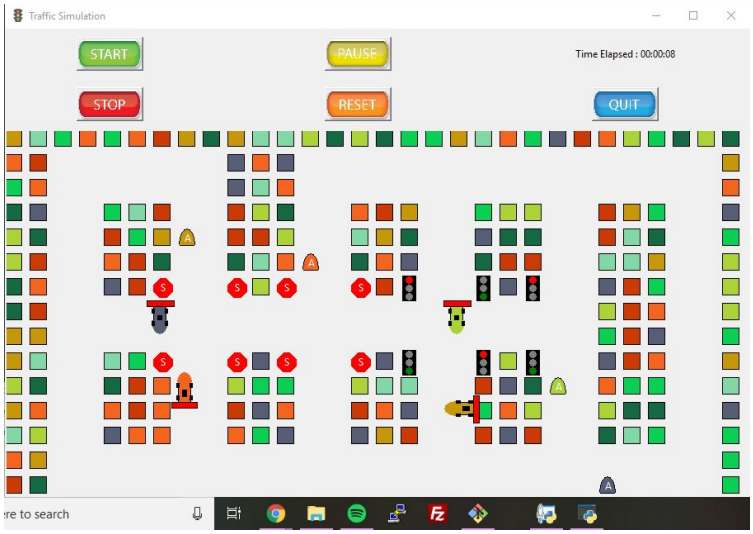


    - Expected output: Simulation Begins

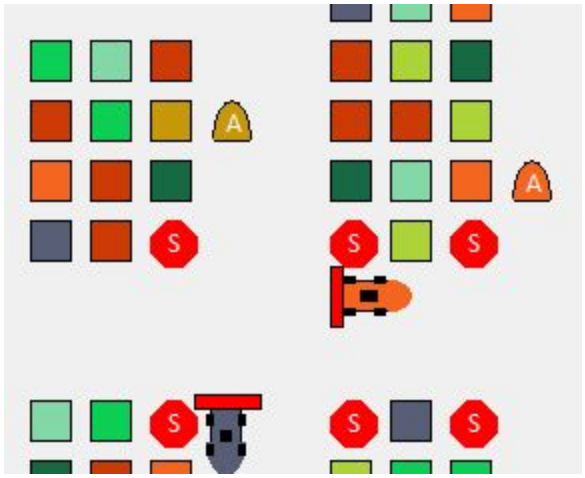


5.1. Test Case 5:

- Component under test: Car, Map, Simulation
- Feature(s) to be tested: 1,2,3,4,5,6,7
- Initial Conditions:
    - Simulation Open with Map, Cars, Traffic features, and destination
- Expected Behavior:
    - Input: Click Start

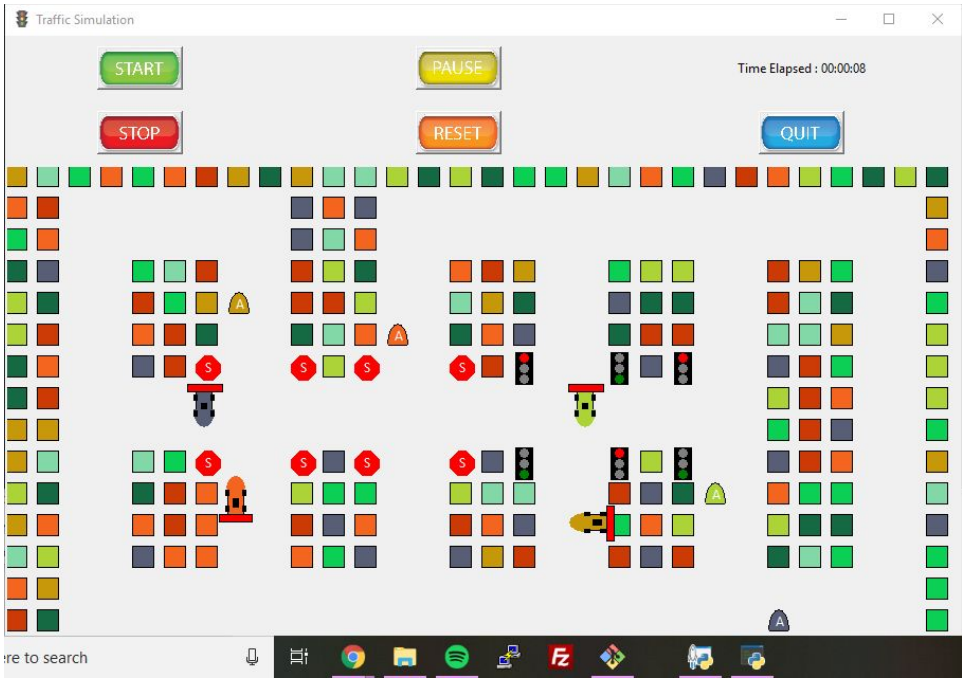


- Output: Car stops at stop sign for a total of 3 steps

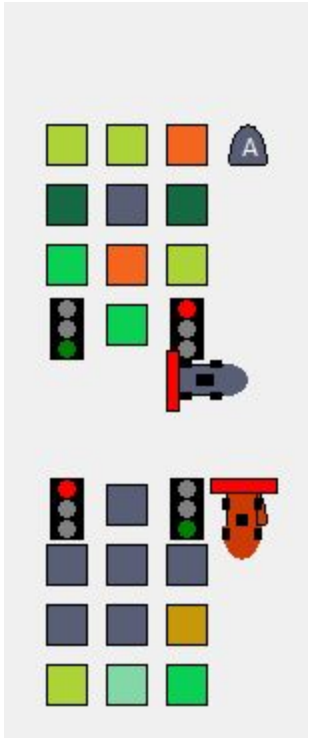


5.1. Test Case 6:

- Component under test: Car, Map, Simulation
- Feature(s) to be tested:1,2,3,4,5,6, 7
- Initial Conditions:
  - Simulation Open with Map, Cars, Traffic features, and destination
- Expected Behavior:
  - Input: Click Start

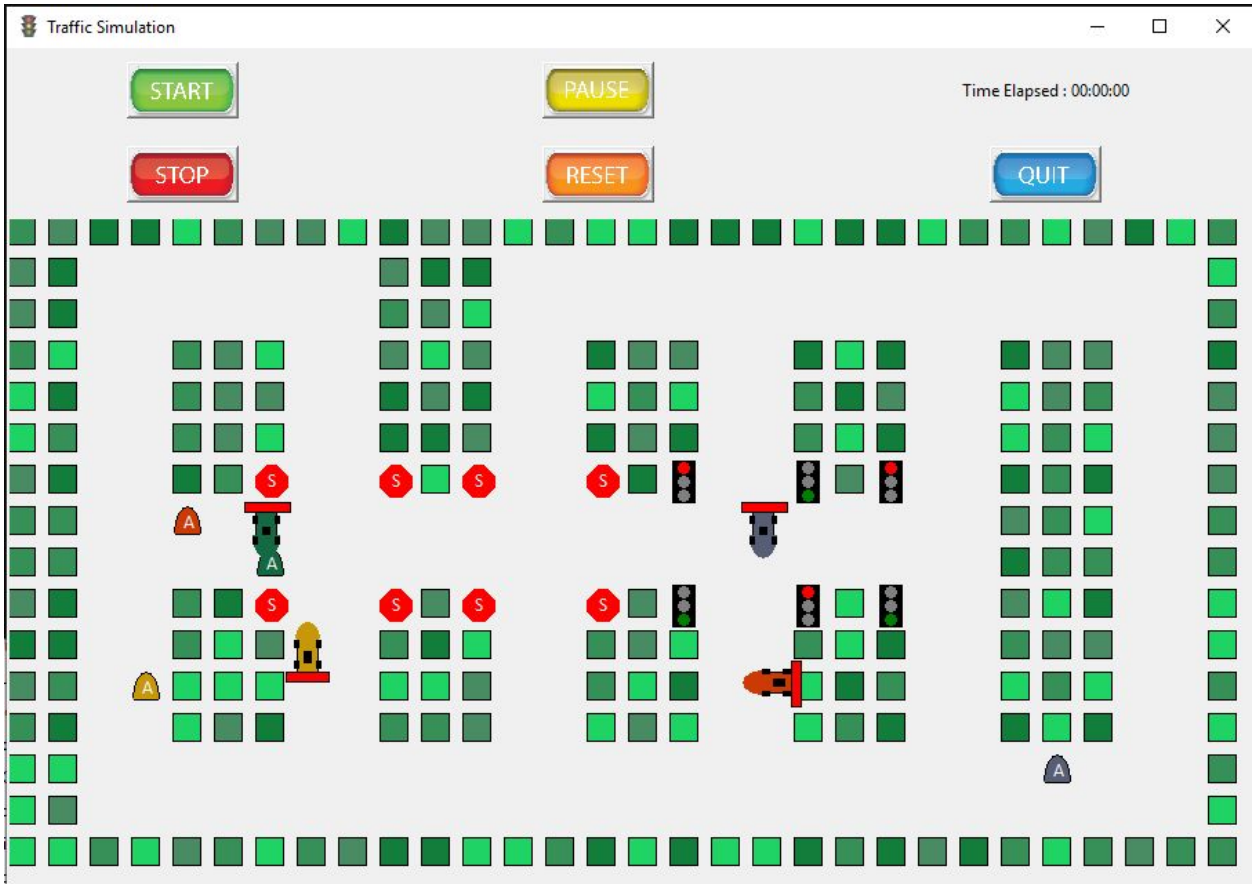


- Output: Car stops at traffic light when it is red for a total of 3 steps



5.1. Test Case 6:

- Component under test: Car, Map, Simulation
- Feature(s) to be tested:1,2,3,4,5,6, 7
- Initial Conditions:
    - Map is Idling
- Expected Behavior:
    - Timer stays at 00:00



5.1. Test Case 7:

- Component under test: Car, Map, Simulation
- Feature(s) to be tested:1,2,3,4,5,6, 7
- Initial Conditions:
    - Simulation is completed / Stopped,
- Expected Behavior:

- Input : Reset clicked
- Output : Nothing happened