**CP2406 Programming 3 Assignment 1**

*By: Matthew Cabinian*

**Problem Specification:**

The problem provided was to design and create a functioning car traffic simulator designed to at least use Cars, Motorbikes and Buses. The program must showcase the road with working traffic lights along with the various vehicles moving along the road and pass through. Not only that but must also allow timing duration for each of the traffic lights to work and allow cars to move through the intersection segments within the simulated road.

**Problem Decomposition:**

As there are various objects needed to run for the simulation to fully function, the objects are divided into the following:

* Road:

As the road needs to be able to track the various vehicle objects and have the traffic lights stationed at different segments of the road. To accomplish this, the road will be separated into 2 car lanes both either going east or west and have intersections going north and south along with traffic lights associated to each intersection added.

* Road ID
* Intersection ID
* Start Location
* End Location
* Directions (East, West, South, North)
* Vehicle:

Vehicle class is

* Car:

1. Speed:
2. Length:
3. Wheels:
4. Width:
5. Movement:

* Bus:

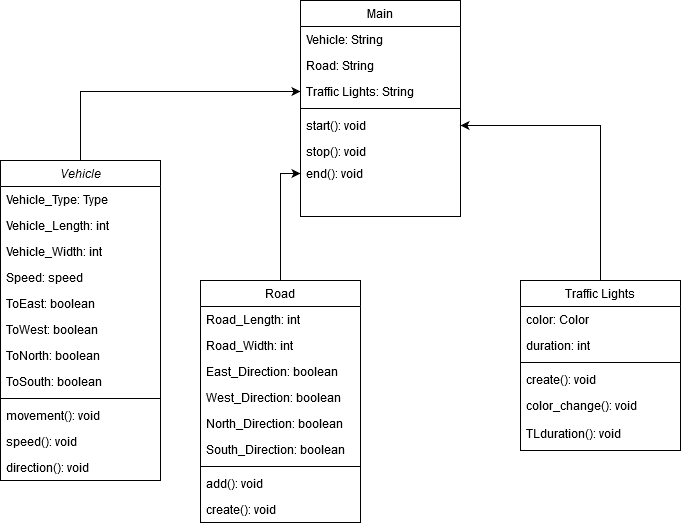
Same variation as Car but is 3x the length

* Motorbike:

Same variation as Car but has 2 wheels and 1 unit shorter than Car

* Traffic Lights:
* Color Change:
* Duration:

**UML Class Diagram**



**User Stories**

1. Person 1:

|  |  |
| --- | --- |
| Name: | Adrien Agreste |
| Age: | 18 |
| Purpose: | The user has approached our team and said that while he is willing to purchase a car for his 18th birthday, his father is not willing to allow his son to test cars until he finalizes his decision on which car to purchase. |
| Priority Level: | High |
| Test: | The user will describe the vehicle specifications for the simulation to determine how fast, how far, how big and how it is able to perform on the road simulation. |

1. Person 2:

|  |  |
| --- | --- |
| Name: | Ryan Sterling |
| Age: | 34 |
| Purpose: | The user has asked our team for assistance. As the head of a car production company, he asks that our team for a program that can determine the speed of vehicle of his choosing when these specific vehicles are on the road |
| Priority Level: | Medium |
| Test: | When the user asks for a specific speed for a vehicle, the program will showcase the speed for the vehicle and demonstrate the speed in the car simulator |

1. Person 3:

|  |  |
| --- | --- |
| Name: | Christina Everlore |
| Age: | 25 |
| Purpose: | This user approached our team with the issue related to the algorithm of traffic algorithms. She was tasked with overseeing construction of a newly built road and needed guidance for how long the traffic system turns red to green, vice versa. |
| Priority Level: | Medium |
| Test: | When using the simulation, check the duration of the traffic lights from switching depending on the lane, no. of cars, etc. |

1. Person 4:

|  |  |
| --- | --- |
| Name: | Marinette Dupain |
| Age: | 30 |
| Purpose: | The user asked our team for assistance as she is currently a recently appointed driving instructor but from another country and will move to Australia for her occupation. She requested to understand the traffic flow and direction of the traffic in Australia to be able to adapt and learn and readjust her teaching methods when she relocated to Australia |
| Priority Level: | Low |
| Test: | The simulation must have at least showcased the direction for the road and where the vehicle goes when moving along the road. |

Git hub repository:

<https://github.com/Matthewcabinian144/CP2406-Assignment-1>