**The working document**

To plan out the software development process, your working document is expected to describe the following:

* 1. **Problem specification:** What exactly is the problem? How will the program be used? How will the program behave?

**The problem is making vehicle run on the road when traffic light is display green and stop car when it displays red, while the vehicle is moving the traffic light should change** from 1% up to 99%.

The program should be use main class’s constructor to call methods from different classes, the program should be display vehicle’s position on which road, color of the traffic light and rate of traffic light change.

* 1. **Problem decomposition using UML class diagrams:** What objects will be used and how will they interact?
  2. Divide the problem into objects

First of all, the objects are based on the problem, there will be a vehicle class, road class, traffic lights class and main class, then there will be testing classes for road class and traffic lights class. Vehicle class and traffic lights class are based on the road class, because it will be clear to explain that vehicle is moving on which road and traffic light is on which road.

* 1. The UML class diagrams should answer the following design questions:
  2. Class design:
  3. What role(s) do objects of this class perform?

Vehicle class is for display the vehicle position and update the vehicle movement. TrafficLights class is for display the rate of light change and light colour. Road class is for display road length, road connect to the next road and where the next traffic light is. Main class is to make vehicle moving on the certain road and traffic light is changing which certain time. RoadTest class is for making sure the class is working and TrafficLights class is for making sure the class is working.

* 1. What member fields do objects of this class need? Should they be public or private?

Because TrafficLights class and Vehicle class are based on Road class. Therefore, the member fields in those objects need to be inside of the Road class. They should be public, so the class be able to access it.

* 1. What methods do objects of this class need? Should they be public or private?

The methods should be getter and setter, and it should be public for other class to access.

* 1. Method design:
  2. What should its method signature be?

The method should be clear to pointing out what information they need and make it simple.

* 1. What task will it perform? What algorithm will it use?

It will perform in the main class. The algorithm will be for loop and if statement.