Problem Specification:

The problem being addressed is designing and building a car traffic simulator. The program will generate car objects of varying statistics and run them through a city simulator based on their speed and location. Objects will be generated randomly and will be deleted once they move outside of the bounds.

**The working document:**

To help you plan 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?
  2. **Problem decomposition using UML class diagrams:** What objects will be used and how will they interact?
  3. Divide the problem into objects
  4. The UML class diagrams should answer the following design questions:
  5. Class design:
  6. What role(s) do objects of this class perform?
  7. What member fields do objects of this class need? Should they be public or private?
  8. What methods do objects of this class need? Should they be public or private?
  9. Method design:
  10. What should its method signature be?
  11. What task will it perform? What algorithm will it use?

You are not expected to produce a complete development report – that’s why it’s called a “working document”. However, you need to at least produce the following outcomes for this first part of the project work:

* 1. Produce a working document that illustrates your designs for **approximately 4-6 classes** – one of which will be the **Main** class that contains the **main()** method
  2. The classes should be drawn in a UML class diagram – the diagram should include information about class names, member field access control, method access control and class relationships (you get marks for using the correct UML notation for these things)
  3. Pick **at least 3 classes and start implementing** **them** – include appropriate **test classes** that check and verify that these 3 production classes are working as expected - *there is no need to create a test class for the Main class*!
  4. You get marks for ensuring that your class code matches your UML class diagrams – *there is no need to include the test classes in your UML class diagrams*!