**Traffic Light Simulation Report:**

Firstly, I started off by drawing a flowchart to get a clear image and plan of how to lay out my code. I decided to go with 8 lights:

* red, amber, green for the north / south lights.
* red, amber, green for the east / west lights.
* red and green lights for the pedestrians.

Furthermore, during this thought process I set out a switch statement, while, do while and if else statement to see which one would work best. I decided to go with an if else.

Secondly, once I started coding I began by defining what all the different pins were, where they were and what they meant; for example, “REDLEDN” means the north red LED. Furthermore, I also defined low to off and high to on so that in my code I could just say “ON” for the light to be “ON” and “OFF” for the light to be “OFF” instead of low or high every time. Next, I set up which pins I will be using with “pinMode(13, OUTPUT)” all the way down to pin 6 as I have 8 lights.

Finally, I started off the light system with all red lights on, then my code will check for an input or not; so, if someone press “H” it will make the car lights go to amber then red (for safety) then the pedestrian light to green. If there is no input, then it will run like a normal traffic light system where there is no pedestrian crossing. Furthermore, I did this using an if statement. In addition, as per instructed by the assignment brief, the traffic lights go: red -> red amber -> green -> amber -> repeat. In addition, I set the traffic lights to stay on for 3 seconds when they are red or green, a second and a half when they are amber and red and for 5 seconds when the pedestrian is crossing. I chose 3 seconds for the cars as this seemed appropriate and not too long or short, a second and a half for amber and red because usually these change quickly in a traffic light system and 5 seconds for the pedestrians to give them enough time to cross safely.