CS22510 Assignment 1

When I first started looking at the assignment I was quite confused on what it was asking to do and how I would implement it. I read through the specification/brief a few times and it started to make sense. I worked out what the numbers in the two text files provided meant and what formulas to use, but I wasn't sure on how to use the numbers within the formulas. So I extracted all the data into Microsoft Excel where I could experiment with it, and actually plot a graph with the data I produce. I listed all the data and imputed the formulas into the cells. I used the formula as it said within the brief but I forgot to convert to radians. This was an easy fix and the graph produced matched the example output provided.

Once I knew what I needed to do, I started thinking about how I wanted to implement it. I made sure I had all the correct packages to run a C++ IDE, this includes CMake, Make, gcc and g++. Firstly I wanted to read in the data from the two text files provided. Within the main function I decided to call a function that would read in the data. I started researching on methods to read in data from files. I noticed on the cplusplus.com website that ifstream could be used [1]. This was very easy to implement, I set the working directory in the IDE as the directory that held all of the cpp and h files. All I needed to do was open the file and use the ifstream to read in data into an object that I later created, then close the file.

Next was to create the object class files that would hold the data read in from the files. Data was going to be read often and I didn't want to store all the objects in an array, so I decided to use vectors. I created all the getters and setters that I thought I would need throughout the assignment and added any later that I might have missed. I found it hard to implement an array for the sensors in the data object, so I used separate variablerts within the object. This then lead to the switch statements used within the getters and setters for the sensors, I thought this would be easier and more efficient than having multiple functions doing the same thing for the different sensors. The data object could have been an abstract class but I decided that using a variable to identify each object would help if any problems occurred when trying to print the graph, this is the only variable used in the constructor.

Next I created the graph handler class. This wasn't going to be used as an object but just encapsulate all the code needed to create, plot and print the graph to the terminal. For this I needed to use the cmath and unistd header files. The cmath header file was used for to round the x and y co-ordinates, also the use of sin and cos were needed to calculate the x and y co-ordinates of the objects. The unistd header file was used for the delay (usleep) so that it would create an "animation". I created 3 functions within the graph handler. The first one was to create a graph, the parameter used was the size of the graph needed. I created some code that would create a border and blank cells that would be fitted to the size of the graph. As the graph was stored in an array, the next function was to print the graph, this just needed to be printed in reverse.

The last function needed was to plot the co-ordinates onto the graph. This was done by passing the vector from main.cpp. These were then converted into the correct co-ordinates.

Overall I found the assignment very easy going. The only change that I would have changed if I was re-doing this assignment is I would have changed the sensor values from being separate into an array.

[1] – ifstream, cplusplus, 2/03/16 -
http://www.cplusplus.com/reference/fstream/ifstream/?kw=ifstream