**Tasks and Analysis for Simple Harmonic Motion Experiment**

Before or after the experiment you will be required to add or remove some pieces of python code to a python script **(SHM1.py)** that **{\displaystyle {P}\propto {T},}**uses the accelerometer to record the changing acceleration values. The tasks are as follows:

1. **IF else statement**

Add a block of code inside the while loop that sets the LED screen to a specific color if each of the acceleration in the X, Y ,Z direction is greater than or equal to 0.7

**Hint:** To set all the LEDs to a specific color, use **sense.set\_pixels(pixel\_list)** depending on the color of choice. Such as green\_list or red\_list.

1. **While loop**

The while loop of this python script is an endless loop i.e. it will run continuously. Add a break statement given the condition that when the loop counter gets to 10, the program should stop looping.

1. **For loop**

Change the while loop above to for loop. Make the loop run only 10 times

1. **Functions**

A function called storeXYZ\_values has been defined in the beginning of this python script. This function allows you to automatically save the acceleration and time interval values in a csv file. You are required to write a piece of code to call the function in a specific part of the script. The location will be indicated in the SHM1.py script.

1. **Graph your recorded values directly from the csv file**

Create a new python script called acc\_graph.py to graph your recorded x acceleration values against time directly from the csv file.

Here’s a simplified example of how matplotlib could be used to graph data loaded from a csv file.

**#imports the necessary modules to run the script**

**import matplotlib**

**import csv**

**matplotlib.use("TKAgg")**

**import matplotlib.pyplot as plt**

**# arrays to store the different values of each data to be plotted**

**x = []**

**y = []**

**# command to read a specific csv file, take the required data needed from the file and #append to each data to its corresponding array**

**with open('example.txt','r') as csvfile:**

**plots = csv.reader(csvfile, delimiter=',')**

**for row in plots:**

**x.append(float(row[0]))**

**y.append(float(row[1]))**

**plt.plot(x,y, label='Loaded from file!')**

**plt.xlabel('x')**

**plt.ylabel('y')**

**plt.title('Interesting Graph\nCheck it out')**

**plt.legend()**

**plt.show()**