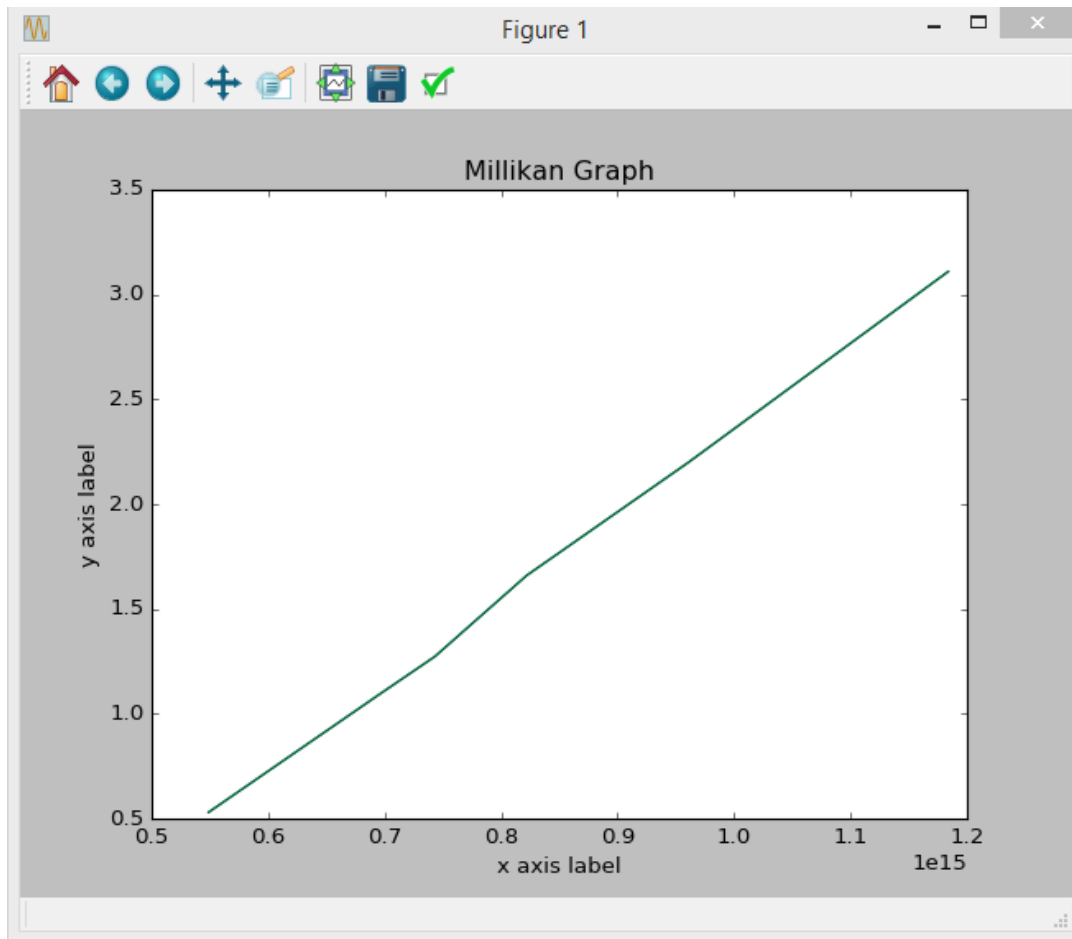


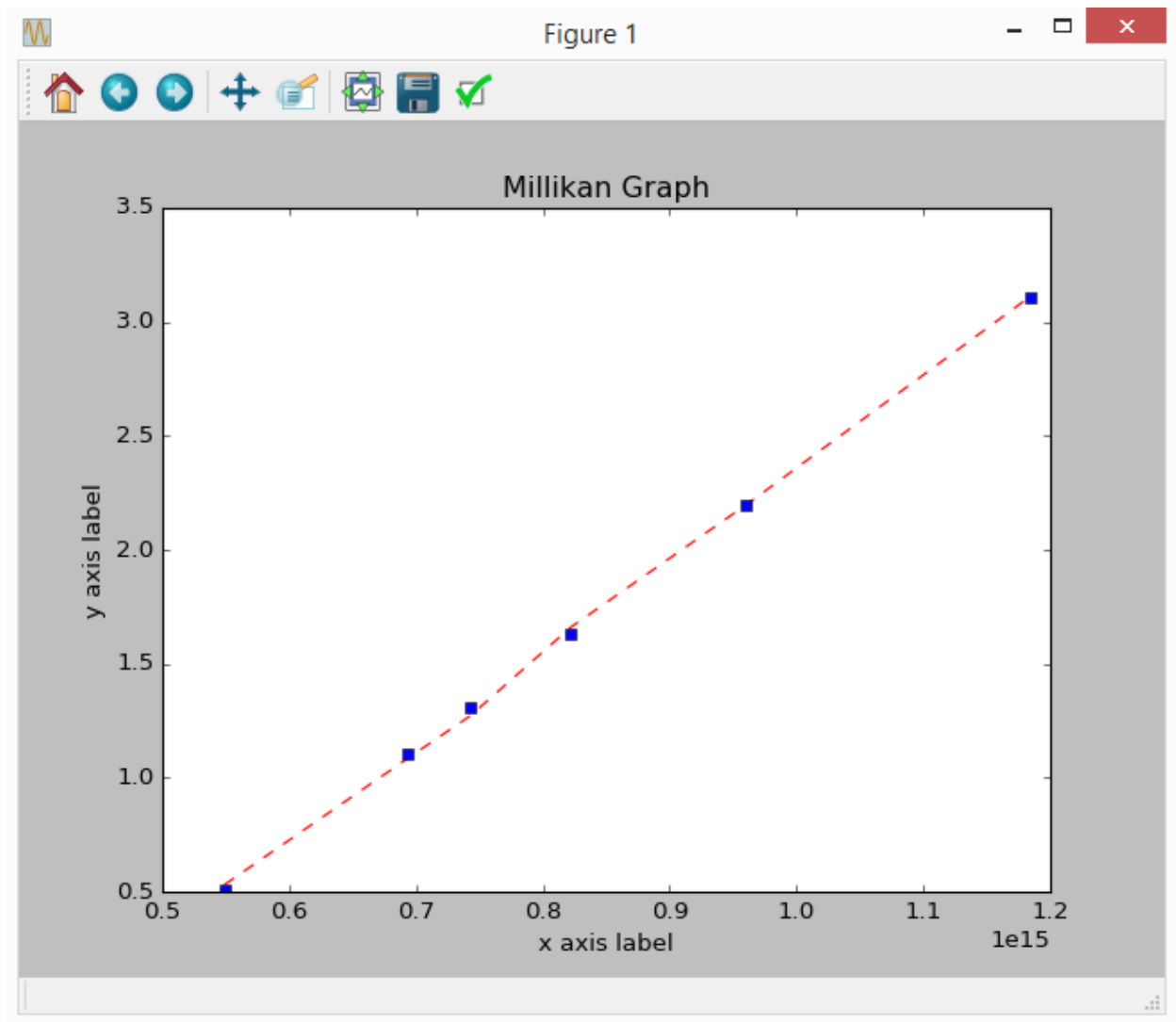
## Problem 2:



In 2a I simply graphed the points after reading them in using `readFile.read`.

```
In[53]: execfile('Prob2.py')
(4.088227358517502e-15, ' is the slope')
(-1.73123580398135, ' is the y intercept')
```

In 2b I used the formula to calculate for the slope and the y intercept of the graph.



After performing the least squares approximation, this was the resulting line. I got this by applying the formulas for the various  $E$  values, and then subbing them into the formula providing for the  $m$  and  $c$  values. Plotting this with the original  $X$  values gave me this.

part d. Finding Planck's constant

$$V = \frac{h}{e} \nu - \phi \rightarrow c$$

$$m = \frac{h}{e}$$

$$\text{slope} = \frac{4.088 \times 10^{-15}}{1.6 \times 10^{-19}}$$

$$m \cdot e = h$$

$$4.088 \times 10^{-15} \cdot 1.6 \times 10^{-19} = h$$

$$h = 6.5408 \times 10^{-34}$$

$$\text{actual } h = 6.626 \times 10^{-34}$$

$$\% \text{ error} = \frac{6.626 \times 10^{-34} - 6.5408 \times 10^{-34}}{6.626 \times 10^{-34}} \times 100$$

$$= 1.16 \% \text{ error}$$

For part d I simply set the equation of  $h/e$  equal to the slope I got from the code, this gave me a 1.16% error from the true planck's constant value.