

```
In [10]: import numpy as np
import math

def tip(x0):
    x = 20* x0/100
    return x
print(tip(500))

def vol(r):
    v = (4/3)*(math.pi)*r**3
    return v
print (vol(4))

def force(m1,m2,r,G):
    f = G*(m1*m2/r**2)
    return f
print(force(5.972*10**24, 7.348*10**22, 3.8448*10**8, 6.674*10**(-11)))

100.0
268.082573106329
1.9811969105842694e+20
```

In []:

```
In [13]: import numpy as np

my_data = np.genfromtxt('lab1data.csv', delimiter = ',')
#Delete the top row
my_data = np.delete(my_data, 0, 0)
print (my_data)

#Calculating the average and the Standard deviation of each column
mean = np.mean(my_data, axis = 0)
stdv = np.std(my_data, axis = 0)

print("x =", mean[0], "+/-", stdv[0])
print("y =", mean[1], "+/-", stdv[1])
```

```
[[5.256 8.017]
 [5.328 8.45 ]
 [4.912 8.697]
 [5.668 7.95 ]
 [4.981 8.34 ]
 [5.171 8.402]
 [5.44  8.161]
 [5.09  7.831]
 [5.128 7.691]
 [5.158 8.451]
 [5.45  8.382]
 [5.798 9.882]
 [5.348 7.083]
 [5.116 8.611]
 [5.447 8.766]
 [5.22  9.359]
 [5.336 8.845]
 [5.575 8.037]
 [5.19  8.544]
 [5.341 8.869]]
x = 5.297649999999999 +/- 0.21746293362318103
y = 8.418400000000002 +/- 0.5883315731796144
```

```
In [12]: import numpy as np

my_data = np.genfromtxt('lab1data.csv', delimiter = ',')
#Delete the top row
my_data = np.delete(my_data, 0, 0)

import matplotlib.pyplot as plt

my_data = my_data.transpose()

plt.scatter(my_data[0], my_data[1])
plt.axis([0,8,0,10])
plt.xlabel("Width (cm)")
plt.ylabel("Length (cm)")
plt.show;
```

