```
In [3]: ls
```

code.ipynb   sec1_992B_sensor2   sec1_9952_sensor1

SENSOR 1 INFO

```
In [70]: import numpy as np
         import pylab as pl

         data_9952=np.fromfile('sec1_9952_sensor1', dtype=np.complex64)
```
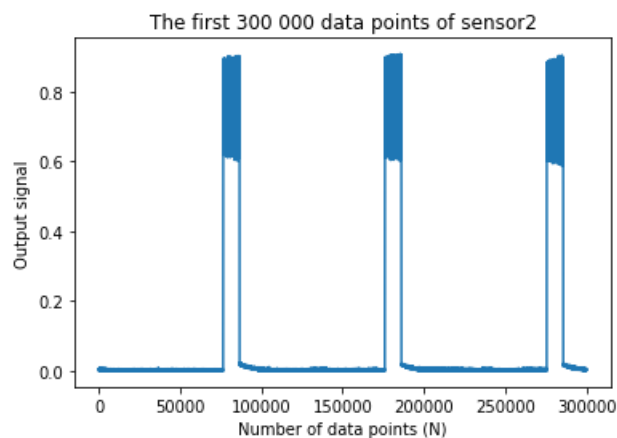
```
In [71]: len(data_9952)
```

Out[71]: 26214400

```
In [62]: np.abs(data_9952)
```

Out[62]: array([0.00030057, 0.00264435, 0.00321122, ..., 0.00140516, 0.00150779,
         0.00200701], dtype=float32)

```
In [65]: pl.plot(np.abs(data_9952[0:300000]))
         pl.xlabel('Number of data points (N)')
         pl.ylabel('Output signal')
         pl.title('The first 300 000 data points of sensor1')
```

Out[65]: Text(0.5,1,'The first 300 000 data points of sensor2')

SENSOR 2 INFO

```
In [20]: import numpy as np
         import pylab as pl

         data_992B=np.fromfile('sec1_992B_sensor2', dtype=np.complex64)
```
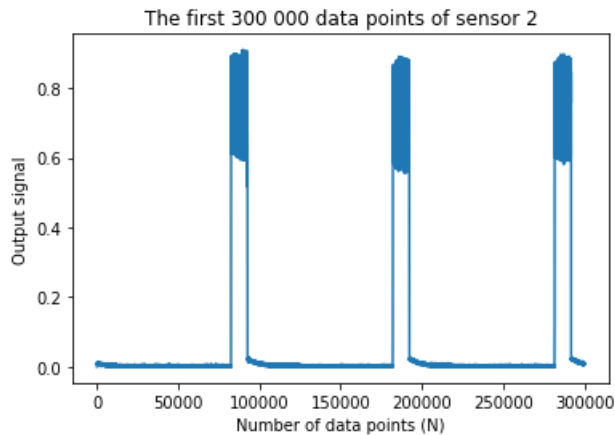
```
In [14]: len(data_992B)
```

Out[14]: 26214400

```
In [16]: np.abs(data_992B)
```

Out[16]: array([0.00043374, 0.00446128, 0.00919086, ..., 0.00061794, 0.00056107,
         0.0030611], dtype=float32)

```
In [66]: pl.plot(np.abs(data_992B[0:300000]))
         pl.xlabel('Number of data points (N)')
         pl.ylabel('Output signal')
         pl.title('The first 300 000 data points of sensor 2')

Out[66]: Text(0.5,1,'The first 300 000 data points of sensor 2')
```
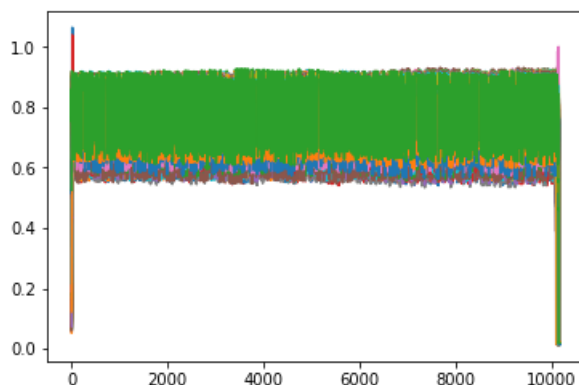


```
In [ ]:
```

DETECTING JUMPS IN TWO SENSORS

DETECTING JUMPS OF SENSOR 1

```
In [59]: i=0
         while i<criteria:


             #################################
             if data_9952[i]>=0.05:
                 pl.plot(np.abs(data_9952[i:i+10172]))

                 i=i+10800
                 #plt.figure()
                 #plt.plot(mean1)
                 #plt.savefig('plot' + str(n) + '.png')
             #################################
                 i=i+1
```


DETECTING JUMPS OF SENSOR 2

```
In [60]:  i=0
          while i<criteria:

              ###################################
              if data_992B[i]>=0.05:
                  pl.plot(np.abs(data_992B[i:i+10172]))

                  i=i+10800
                  #plt.figure()
                  #plt.plot(mean1)
                  #plt.savefig('plot' + str(n) + '.png')
              ###############################
                  i=i+1
```
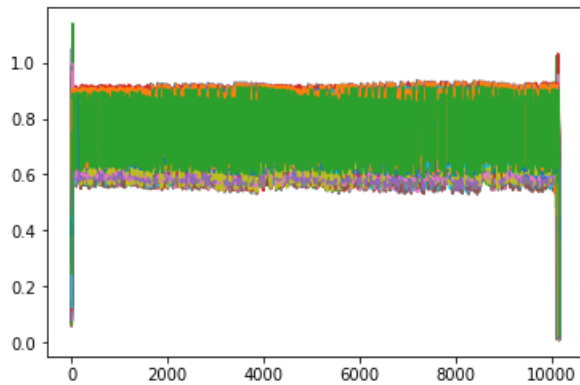


```
In [ ]:
```

CREATING DATASET FROM SENSOR 1 = data_9952

In sensor 1, I noticed repetition when the first jump is detected. So, I graphed jumps, and and chose a starting point of 0.05 point. Then, since the length of the jumps are the same, the legth of 10172 values will be cut. Then mean, variance and standard deviation of data is taken to create a dataset.

```
In [72]:  criteria_sensor1 = len(data_9952)
```

```
In [73]:  import matplotlib.pyplot as plt
          d=0
          i=0
          mean1=np.arange(264.)
          std1=np.arange(264.)
          var1=np.arange(264.)
          while i < criteria_sensor1:

              ###################################
              if data_9952[i]>=0.05:
                  mean1[d]=np.mean(np.abs(data_9952[i:i+10172]))
                  std1[d]=np.std(np.abs(data_9952[i:i+10172]))
                  var1[d]=np.var(np.abs(data_9952[i:i+10172]))
                  d=d+1
                  i=i+10800
                  #plt.figure()
                  #plt.plot(mean1)
                  #plt.savefig('plot' + str(n) + '.png')
              ###############################
                  i=i+1
```

```
In [82]:  mean1[260:265]
```

```
Out[82]:  array([  0.82105356,   0.84157461,   0.86384863, 263.          ])
```

```
In [83]:  std1[260:265]
```

```
Out[83]:  array([8.10345337e-02, 7.91415721e-02, 8.24272111e-02, 2.63000000e+02])
```

```
In [84]:  var1[260:264]
```

Out[84]: array([6.56659575e-03, 6.26338879e-03, 6.79424452e-03, 2.63000000e+02])

```
In [87]:  mean1=mean1[:-1]
          std1=std1[:-1]
          var1=var1[:-1]
```

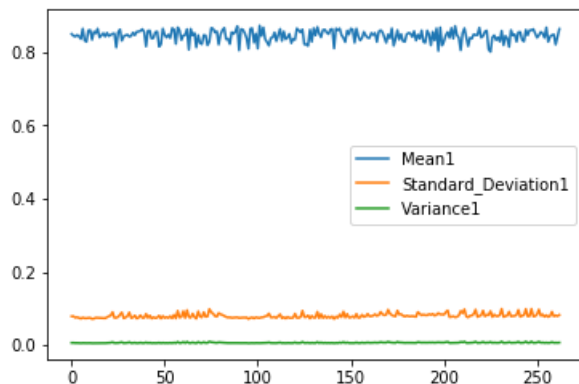```
In [88]: dataset={'Mean1':mean1, 'Standard_Deviation1':std1, 'Variance1':var1}
          import pandas as pd
          df1=pd.DataFrame(data=dataset)
          df1.head()
```

Out[88]:

|   | Mean1 | Standard_Deviation1 | Variance1 |
|---|-------|---------------------|-----------|
| 0 | 0.850092 | 0.078530 | 0.006167 |
| 1 | 0.845105 | 0.078634 | 0.006183 |
| 2 | 0.842906 | 0.074997 | 0.005625 |
| 3 | 0.847141 | 0.076289 | 0.005820 |
| 4 | 0.843402 | 0.074116 | 0.005493 |

```
In [89]:  df1.plot()
```

Out[89]: <matplotlib.axes._subplots.AxesSubplot at 0x16b5a8588>


```
In [ ]:
```

CREATING DATASET FOR SENSOR2 = data_992B

In sensor 2 too, I noticed repetition when the first jump is detected. So, I graphed jumps, and and chose a starting point of 0.05 point. Then, since the length of the jumps are the same, the legth of 10172 values will be cut. Then mean, variance and standard deviation of data is taken to create a dataset.

```
In [90]:  criteria_sensor2 = len(data_992B)
```

```python
In [91]: import matplotlib.pyplot as plt
         d=0
         i=0
         mean2=np.arange(264.)
         std2=np.arange(264.)
         var2=np.arange(264.)
         while i < criteria_sensor2:

             ################################
             if data_992B[i]>=0.05:
                 mean2[d]=np.mean(np.abs(data_992B[i:i+10172]))
                 std2[d]=np.std(np.abs(data_992B[i:i+10172]))
                 var2[d]=np.var(np.abs(data_992B[i:i+10172]))
                 d=d+1
                 i=i+10800
                 #plt.figure()
                 #plt.plot(mean1)
                 #plt.savefig('plot' + str(n) + '.png')
             ################################
             i=i+1
```

```python
In [92]: mean2[260:264]
```

```
Out[92]: array([  0.83636916,   0.86242604,   0.84080994, 263.        ])
```

```python
In [94]: std2[260:264]
```

```
Out[94]: array([8.22485164e-02, 8.54459330e-02, 7.91653544e-02, 2.63000000e+02])
```

```python
In [93]: var2[260:264]
```

```
Out[93]: array([6.76481891e-03, 7.30100786e-03, 6.26715366e-03, 2.63000000e+02])
```

```python
In [95]: mean2=mean2[:-1]
         std2=std2[:-1]
         var2=var2[:-1]
```

```python
In [96]: dataset={'Mean2':mean2, 'Standard_Deviation2':std2, 'Variance2':var2}
         import pandas as pd
         df2=pd.DataFrame(data=dataset)
         df2.head()
```
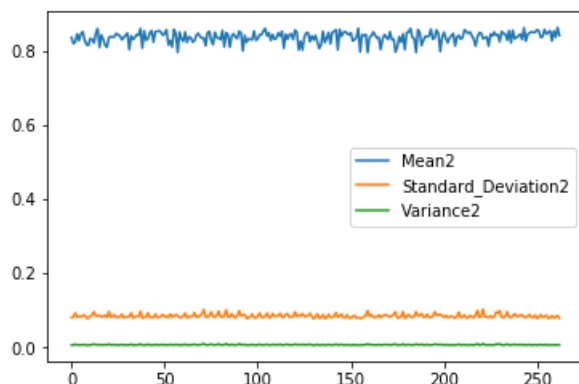
Out[96]:

	Mean2	Standard_Deviation2	Variance2
0	0.835177	0.080636	0.006502
1	0.818871	0.082957	0.006882
2	0.823802	0.092954	0.008641
3	0.845044	0.081661	0.006668
4	0.827356	0.084111	0.007075

```python
In [97]: df2.plot()
```

```
Out[97]: <matplotlib.axes._subplots.AxesSubplot at 0x16b67d5f8>
```

NOW, WE WILL MERGE THEM, TO CREATE A COMMON DATASET

```
In [98]: data_add=pd.concat([df1,df2],axis=1)
```

```
In [99]: data_add.head()
```

Out[99]:

	Mean1	Standard_Deviation1	Variance1	Mean2	Standard_Deviation2	Variance2
0	0.850092	0.078530	0.006167	0.835177	0.080636	0.006502
1	0.845105	0.078634	0.006183	0.818871	0.082957	0.006882
2	0.842906	0.074997	0.005625	0.823802	0.092954	0.008641
3	0.847141	0.076289	0.005820	0.845044	0.081661	0.006668
4	0.843402	0.074116	0.005493	0.827356	0.084111	0.007075

```
In [100]: data_add.to_csv('new_section_10_april.csv')
```

```
In [ ]:
```