

```
In [ ]: #Name: Neha Kamalakar Nemade
        #Roll no: 22150
        #Batch: G-5
```

```
In [7]: #Maximum element from array
import numpy as np
ptr=np.array([[30,90,70],
              [2,3,4],
              [48,88,38]])

#return the maximum value from array
print(np.amax(ptr))

#return the maximum value from each column
print(np.amax(ptr,axis=0))

#return the maximum value from each row
print(np.amax(ptr,axis=1))

90
[48 90 70]
[90  4 88]
```

```
In [22]: #Minimum element from array
import numpy as np
a=np.array([[30,90,70],
            [2,3,4],
            [48,88,38]])

# Return the minimum value from the array
print(np.amin(a))

# Return the minimum value from the each column
print(np.amin(a,axis=0))

# Return the minimum value from the each row
print(np.amin(a,axis=1))

2
[2 3 4]
[30  2 38]
```

Average and weighted average of array

```
In [21]: import numpy as np
a=np.array([[30,90,70],
           [2,3,4],
           [48,88,38]])
print("Average = ",np.average(a))
wt=[7,8,9]
print("\nWeighted average = ",np.average(a,weights=wt,axis=0))
print("\nWeighted average = ",np.average(a,weights=wt,axis=1))
```

Average = 41.44444444444444

Weighted average = [27.41666667 60.25 36.]

Weighted average = [65. 3.08333333 57.58333333]

mean of rows and columns

```
In [5]: import numpy as np
a=np.array([[30,90,70],
           [2,3,4],
           [48,88,38]])
print("Mean of the array = ",np.mean(a))
print("\nMean of the columns = ",np.mean(a,axis=0))
print("\nMean of the rows = ",np.mean(a,axis=1))
```

Mean of the array = 41.44444444444444

Mean of the columns = [26.66666667 60.33333333 37.33333333]

Mean of the rows = [63.33333333 3. 58.]

Median of sorted array

```
In [6]: import numpy as np
a=np.array([[30,90,70],
           [2,3,4],
           [48,88,38]])
print("Median of the array = ",np.median(a))
print("\nMedian of the columns = ",np.median(a,axis=0))
print("\nMedian of the rows = ",np.median(a,axis=1))
```

Median of the array = 38.0

Median of the columns = [30. 88. 38.]

Median of the rows = [70. 3. 48.]

Variance and standard deviation of array

```
In [8]: import numpy as np
a=np.array([[30,90,70],
           [2,3,4],
           [48,88,38]])
print("Variance is: ",np.var(a))
print("\nStandard deviation is: ",np.std(a))
```

Variance is: 1106.9135802469136

Standard deviation is: 33.270310792761066

Covariance in two data sets

```
In [12]: import numpy as np
ds1=np.array([1,3,5,7,9])
ds2=np.array([2,4,6,8,10])

c1=np.cov(ds1,ds2)
print(c1)

ds3=([1,3,5,7,9],[2,4,6,8,10],[20,30,40,50,100])
c2=np.cov(ds3)
print()
print(c2)
```

```
[[10. 10.]
 [10. 10.]]
```

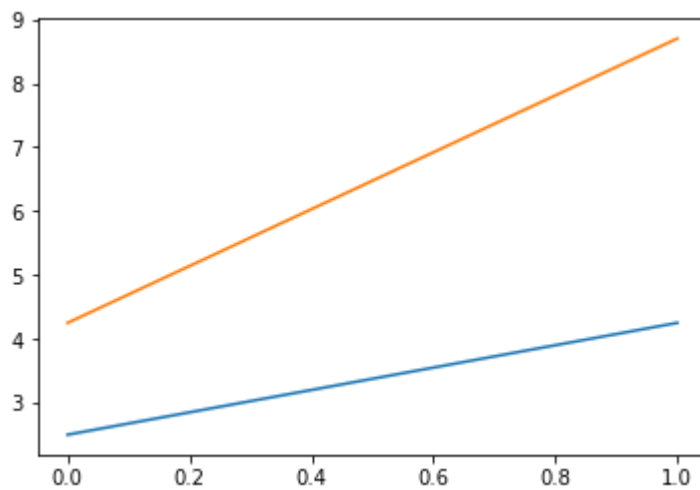
```
[[ 10.  10.   0.]
 [ 10.  10.   0.]
 [   0.   0. 250.]]
```

Plot the covariance

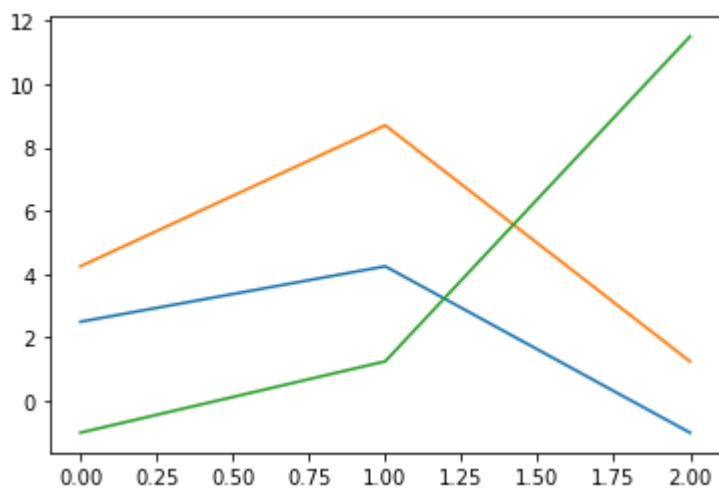
```
In [16]: import matplotlib.pyplot as plt
a=np.array([5,6,4,3,2])
b=np.array([4,9,4,3,1])
c=np.cov(a,b)
print("\nc = ")
plt.plot(c)
plt.show()

print()
a=np.array([[5,6,4,3,2],[4,9,4,3,1],[1,8,4,3,9]])
c1=np.cov(a)
print(c1)
plt.plot(c1)
plt.show()
```

c =



```
[[ 2.5  4.25 -1.  ]
 [ 4.25  8.7  1.25]
 [-1.   1.25 11.5 ]]
```



```
In [18]: #Correlation between two sets
import numpy as np
a=np.array([50,6,40,3,20])
b=np.array([4,9,4,3,1])
print()
c=np.corrcoef(a,b)
print(c)

print()
a=np.array([[5,6,4,3,2],[4,9,4,3,1],[1,8,4,3,9]])
c=np.corrcoef(a)
print(c)
```

```
[[ 1.          -0.23265125]
 [-0.23265125  1.          ]]

[[ 1.          0.91129565 -0.18650096]
 [ 0.91129565  1.          0.12496876]
 [-0.18650096  0.12496876  1.          ]]
```

```
In [19]: #Plot the Correlation
import matplotlib.pyplot as plt
import numpy as np
a=np.array([[5,6,4,3,2],[4,9,4,3,1],[1,8,4,3,9]])
c=np.corrcoef(a)
print(c)
plt.plot(c)
plt.show()
```

```
[[ 1.          0.91129565 -0.18650096]
 [ 0.91129565  1.          0.12496876]
 [-0.18650096  0.12496876  1.          ]]
```

