In [36…
```
print("Hello world") # test
```

```
Hello world
```

Required Libraries

In [37…
```
!pip install numpy
!pip install pandas
```

```
Requirement already satisfied: numpy in c:\users\dell\anaconda3\lib\site
-packages (1.26.4)
Requirement already satisfied: pandas in c:\users\dell\anaconda3\lib\sit
e-packages (2.2.2)
Requirement already satisfied: numpy>=1.26.0 in c:\users\dell\anaconda3
\lib\site-packages (from pandas) (1.26.4)
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\dell\a
naconda3\lib\site-packages (from pandas) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in c:\users\dell\anaconda3\l
ib\site-packages (from pandas) (2024.1)
Requirement already satisfied: tzdata>=2022.7 in c:\users\dell\anaconda3
\lib\site-packages (from pandas) (2023.3)
Requirement already satisfied: six>=1.5 in c:\users\dell\anaconda3\lib\s
ite-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)
```

In [38…
```
import numpy as np
import pandas as pd
```

In [39…
```
arr = np.array([[1, 2, 3], [4, 5, 6]]) #Loading values
```

In [40…
```
print(arr.shape)
```

```
(2, 3)
```

In [41…
```
print(arr[1, 2])       # 6
```

```
6
```

In [42…
```
print(arr[:, 1])
```

```
[2 5]
```

Loading two new values

In [55…
```
import numpy as np

arr1 = np.array([[1, 2, 3], [4, 5, 6], [5, 6, 7]])
arr2 = np.array([[1, 2, 3], [4, 5, 6], [5, 6, 7]])
result = arr1+arr2
print(result)
```

```
[[ 2  4  6]
 [ 8 10 12]
 [10 12 14]]
```

Mathmatical and logical operation

In [57…
```
result = arr1+arr2
print (result)
```

```
[[ 2  4  6]
 [ 8 10 12]
 [10 12 14]]
```

In [59…
```
#Matrix Multiplication
mul_result=arr1*arr2
print(mul_result)
```

```
[[ 1  4  9]
 [16 25 36]
 [25 36 49]]
```

In [45…
```
arr3 = np.array([[7, 8, 9], [1, 2, 3], [4, 5, 6]])
arr4 = np.array([[0, 1, 0], [1, 0, 1], [0, 1, 0]])
result = arr3 + arr4  # Element-wise addition
```

In [60…
```
print(result)
```

```
[[ 2  4  6]
 [ 8 10 12]
 [10 12 14]]
```

Dot Product

In [47…
```
a = np.array([1, 2, 3])
b = np.array([4, 5, 6])
print(np.dot(a, b))  # 32
```

```
32
```

cross Product

In [48…
```
print(np.cross(a,b))
```

```
[-3  6 -3]
```

Filtering the innner values of matrix

In [49…
```
arr = np.array([10, 20, 30, 40])
print(arr[arr > 25])  # [30 40]
```

```
[30 40]
```

In [50…
```
arr = np.array([40, 50, 70, 40])
print(arr[arr > 25])  # [30 40]
```

```
[40 50 70 40]
```

some special mathmatical operations (sum, standrad deviations, maximum from

In [61…
```
x = np.array([1, 2, 3, 4])

print(np.sum(x))       # 10
print(np.mean(x))      # 2.5
print(np.std(x))       # Standard deviation
print(np.max(x))       # 4
print(np.min(x))       # 1
print(np.exp(x))       # e^x
print(np.log(x))       # natural log
```

```
10
2.5
1.118033988749895
4
1
[ 2.71828183  7.3890561  20.08553692 54.59815003]
[0.         0.69314718 1.09861229 1.38629436]
```

Where function in numpy

In [62…
```
x = np.array([1, 2, 3, 4, 5])
np.where(x > 3, 100, 0)
```

Out[62…
```
array([  0,   0,   0, 100, 100])
```

In [63…
```
x = np.array([5, 100 ,600, 700, 500])
np.where(x > 29, 100, 0)
```

Out[63…
```
array([  0, 100, 100, 100, 100])
```

In [ ]: