```
import numpy as np
```

Declaring matrices

```
mx1 = np.array([[5, 10], [15, 20]])
mx2 = np.array([[25, 30], [35, 40]])

print("Matrix1 =\n",mx1)
print("\nMatrix2 =\n",mx2)
```

```
Matrix1 =
 [[ 5 10]
 [15 20]]

Matrix2 =
 [[25 30]
 [35 40]]
```

Addition using Numpy methods

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```
print ("\nAddition of two matrices: ")
print (np.add(mx1,mx2))
```

```
Addition of two matrices:
[[30 40]
 [50 60]]
```

Subtraction using Numpy methods

```
print ("\nSubtraction of two matrices: ")
print (np.subtract(mx1,mx2))
```

```
Subtraction of two matrices:
[[-20 -20]
 [-20 -20]]
```

Division using Numpy methods

```
print ("\nMatrix Division: ")
print (np.divide(mx1,mx2))
```

```
Matrix Division:
[[0.2        0.33333333]
 [0.42857143 0.5       ]]
```

Multiplication using Numpy methods

```
print ("\nMultiplication of two matrices: ")
print (np.multiply(mx1,mx2))
```

```
Multiplication of two matrices:
[[125 300]
 [525 800]]
```

Optimized methods of multiplication

```
mx1 @ mx2
```

```
array([[ 475,  550],
       [1075, 1250]])
```

```
np.matmul (mx1, mx2)
```

```
array([[ 475,  550],
       [1075, 1250]])
```

```
np.dot (mx1, mx2)
```

```
array([[ 475,  550],
       [1075, 1250]])
```

Summation of Matrix

```
mx = np.array([[5, 10], [15, 20]])

print("Matrix =\n",mx)

print ("\nThe summation of elements=")
print (np.sum(mx))

print ("\nThe column wise summation=")
print (np.sum(mx,axis=0))

print ("\nThe row wise summation=")
print (np.sum(mx,axis=1))
```

```
Matrix =
 [[ 5 10]
 [15 20]]

The summation of elements=
50

The column wise summation=
[20 30]

The row wise summation=
[15 35]
```

Transpose of Matrix

```
mx = np.array([[5, 10], [15, 20]])

print("Matrix =\n",mx)

print ("\nThe Transpose =")
print (mx.T)
```

```
Matrix =
 [[ 5 10]
 [15 20]]

The Transpose =
[[ 5 15]
 [10 20]]
```

Numpy method is also available

```
np.transpose (mx)
```

```
array([[ 5, 15],
       [10, 20]])
```

Inverse of a matrix

```
np.linalg.inv (mx)
```

```
array([[-0.4,  0.2],
       [ 0.3, -0.1]])
```