NumPy

```
import numpy as np
```

```
a = list([1, 2, 3])
b = list([4, 5, 6])
print('a = ', a)
print('b = ', b)
print('c = ', a+b)
```

```
a =  [1, 2, 3]
b =  [4, 5, 6]
c =  [1, 2, 3, 4, 5, 6]
```

```
a = np.array(a)
b = np.array(b)
print('a = ', a)
print('b = ', b)
print('c = ', a+b)
```

```
a =  [1 2 3]
b =  [4 5 6]
c =  [5 7 9]
```

```
a / b
```

```
array([0.25, 0.4 , 0.5 ])
```

```
np.sqrt(a)
```

```
array([1.        , 1.41421356, 1.73205081])
```

```
np.sin(a)
```

```
array([0.84147098, 0.90929743, 0.14112001])
```

```
np.arcsin(a)
```

```
<ipython-input-12-1344fc335193>:1: RuntimeWarning: invalid value encountered in arcsin
  np.arcsin(a)
```

```
array([1.57079633,        nan,        nan])
```

```
np.arctan(a)
```

```
array([0.78539816, 1.10714872, 1.24904577])
```

```
a.dot(b)
```

```
32
```

```
np.cross(a, b)
```

```
array([-3,  6, -3])
```

```
a = np.array([[1,5], [5,9], [8,9]])
a
```

```
array([[1, 5],
       [5, 9],
       [8, 9]])
```

```
a.shape
```

```
(3, 2)
```

```
a.reshape(2,3)
```

```
array([[1, 5, 5],
       [9, 8, 9]])
```

```
a.reshape(6,1)
```

```
array([[1],
       [5],
       [5],
       [9],
       [8],
       [9]])
```

```
a.size
```

```
6
```

```
a.itemsize
```

```
8
```

```
a.min()
```

```
1
```

```
a.max()
```

```
9
```

```
np.arange(1,10)
```

```
array([1, 2, 3, 4, 5, 6, 7, 8, 9])
```

```
np.linspace(1,10, 100) //(10-1)=9, 100/9 ده مقدار الزياده كل مره بداية من الواحد
```

```
array([ 1.        ,  1.18367347,  1.36734694,  1.55102041,  1.73469388,
        1.91836735,  2.10204082,  2.28571429,  2.46938776,  2.65306122,
        2.83673469,  3.02040816,  3.20408163,  3.3877551 ,  3.57142857,
        3.75510204,  3.93877551,  4.12244898,  4.30612245,  4.48979592,
        4.67346939,  4.85714286,  5.04081633,  5.2244898 ,  5.40816327,
        5.59183673,  5.7755102 ,  5.95918367,  6.14285714,  6.32653061,
        6.51020408,  6.69387755,  6.87755102,  7.06122449,  7.24489796,
        7.42857143,  7.6122449 ,  7.79591837,  7.97959184,  8.16326531,
        8.34693878,  8.53061224,  8.71428571,  8.89795918,  9.08163265,
        9.26530612,  9.44897959,  9.63265306,  9.81632653, 10.        ])
```

```
np.arange(1,10, 2)
```

```
array([1, 3, 5, 7, 9])
```

```
np.zeros((3,3))
```

```
array([[0., 0., 0.],
       [0., 0., 0.],
       [0., 0., 0.]])
```

```
np.ones((6,3))
```

```
array([[1., 1., 1.],
       [1., 1., 1.],
```

```
            [1., 1., 1.],
            [1., 1., 1.],
            [1., 1., 1.],
            [1., 1., 1.]])
```

```
a.std() //الإنحراف المعيارى
```

```
2.852873794770615
```

```
a.mean()
```

```
6.166666666666667
```

```
inv = np.linalg.inv
trans = np.transpose
```

```
x = np.arange([[1,2,3], [4,5,6], [7,8,9]])
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-6-862da5c9f805> in <cell line: 1>()
----> 1 x = np.arange([[1,2,3], [4,5,6], [7,8,9]])

TypeError: unsupported operand type(s) for -: 'list' and 'int'
```

```
y = np.arange(1,10).reshape(3,3)
```

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