In [1]:

```
# khai bao thu vien
import numpy as np
# Universal functions perform operations on all elements in an array
```

In [3]:

```
# khoi tao mang 11 phan tu 0 den 10
arr = np.arange(11)
arr
```

Out[3]:

```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

In [4]:

```
#Taking Square Roots
np.sqrt(arr)
```

Out[4]:

```
array([0.        , 1.        , 1.41421356, 1.73205081, 2.        ,
       2.23606798, 2.44948974, 2.64575131, 2.82842712, 3.        ,
       3.16227766])
```

In [5]:

```
#Calcualting exponential (e^)
np.exp(arr)
```

Out[5]:

```
array([1.00000000e+00, 2.71828183e+00, 7.38905610e+00, 2.00855369e+01,
       5.45981500e+01, 1.48413159e+02, 4.03428793e+02, 1.09663316e+03,
       2.98095799e+03, 8.10308393e+03, 2.20264658e+04])
```

In [6]:

```
# Binary Functions require two arrays
#Random array (normal dist)
A = np.random.randn(10)
A
```

Out[6]:

```
array([ 0.25006826, -0.24213926,  0.73697288,  1.12361088,  0.23513086,
        0.0606963 , -1.13050986,  0.08057309,  1.06915393, -1.57406648])
```

In [7]:

```
#Random array (normal dist)
B = np.random.randn(10)
B
```

Out[7]:

```
array([-0.43641688,  2.16846834, -1.00612919,  0.27725794, -0.87121941,
       -1.62432103,  2.00629922,  0.85257338,  0.48949715,  0.76086709])
```

In [8]:

```
#Addition
np.add(A,B)
```

Out[8]:

```
array([-0.18634862,  1.92632908, -0.26915631,  1.40086882, -0.63608855,
       -1.56362474,  0.87578937,  0.93314647,  1.55865109, -0.81319939])
```

In [9]:

```
#Finding max or min between two arrays
np.maximum(A,B)
```

Out[9]:

```
array([0.25006826, 2.16846834, 0.73697288, 1.12361088, 0.23513086,
       0.0606963 , 2.00629922, 0.85257338, 1.06915393, 0.76086709])
```

In [1]:

```
#For full and extensive list of all universal functions
website = "http://docs.scipy.org/doc/numpy/reference/ufuncs.html#available-ufuncs"
import webbrowser
webbrowser.open(website)
```

Out[1]:

```
True
```

In [ ]:

```

```