In [1]:
```
#import numpy as np
#import numpy
from numpy import *
```

In [2]:
```
arr = array([1,2,3,4,5])
print(arr.dtype)
```

```
int32
```

In [3]:
```
arr = array([1,2,3,4,5.0])
print(arr.dtype)
```

```
float64
```

In [4]:
```
arr+2
```

Out[4]:
```
array([3., 4., 5., 6., 7.])
```

In [5]:
```
arr = array([1,2,3,4,5], float)
print(arr.dtype)
```

```
float64
```

In [7]:
```
# linspace
lin_arr = linspace(0,15,20)
print (lin_arr)
```

```
[ 0.          0.78947368  1.57894737  2.36842105  3.15789474  3.94736842
  4.73684211  5.52631579  6.31578947  7.10526316  7.89473684  8.68421053
  9.47368421 10.26315789 11.05263158 11.84210526 12.63157895 13.42105263
 14.21052632 15.        ]
```

In [8]:
```
# logspace
log_arr = logspace(0,15,20)
print (log_arr)
```

```
[1.00000000e+00 6.15848211e+00 3.79269019e+01 2.33572147e+02
 1.43844989e+03 8.85866790e+03 5.45559478e+04 3.35981829e+05
 2.06913808e+06 1.27427499e+07 7.84759970e+07 4.83293024e+08
 2.97635144e+09 1.83298071e+10 1.12883789e+11 6.95192796e+11
 4.28133240e+12 2.63665090e+13 1.62377674e+14 1.00000000e+15]
```

In [9]:
```
range_arr = arange(1,15,2)
print (range_arr)
```

```
[ 1  3  5  7  9 11 13]
```

In [11]:
```
arr_z = zeros(5)
print (arr_z)
```

```
[0. 0. 0. 0. 0.]
```

In [13]:
```
arr_o = ones(5)
print (arr_o)
```

```
[1. 1. 1. 1. 1.]
```

In [14]:
```
arr_o = ones(15, int)
print (arr_o)
```

```
[1 1 1 1 1 1 1 1 1 1 1 1 1 1 1]
```

In [15]:
```
# Add values
arr = array([1,2,3,4,5])
arr = arr+5
print (arr)
```

```
[ 6  7  8  9 10]
```

In [16]:
```
# Adding arrays
arr1 = array([1,2,3,4,5])
arr2 = array([3,4,5,6,7])
arr3 = arr1+arr2
print (arr3)
```

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

In [18]:
```
# Concatenation
print (concatenate([arr1, arr2]))
```

```
[1 2 3 4 5 3 4 5 6 7]
```

In [19]:
```
arr1 = array([1,2,3,4,5])
print (sin(arr1))
```

```
[ 0.84147098  0.90929743  0.14112001 -0.7568025  -0.95892427]
```

In [20]:
```
print (cos(arr1))
```

```
[ 0.54030231 -0.41614684 -0.9899925  -0.65364362  0.28366219]
```

In [21]:
```
print (sqrt(arr1))
```

```
[1.         1.41421356 1.73205081 2.         2.23606798]
```

In [22]:
```
print (sum(arr1))
```

```
15
```

In [23]:
```
print (min(arr1))
print (max(arr1))
```

```
1
5
```

In [25]:
```
# Copying an array
arr1 = array([1,2,3,4,5])
arr2 = arr1
print (arr1)
print (arr2)
print (id(arr1))
print (id(arr2))
```

```
[1 2 3 4 5]
[1 2 3 4 5]
2773572842080
2773572842080
```

In [26]:
```
# Shallow copy
arr1 = array([1,2,3,4,5])
arr2 = arr1.view()
print (arr1)
print (arr2)
print (id(arr1))
print (id(arr2))
```

```
[1 2 3 4 5]
[1 2 3 4 5]
2773572843680
2773572844880
```

In [27]:
```
arr1 = array([1,2,3,4,5])
arr2 = arr1.copy()
print (arr1)
print (arr2)
print (id(arr1))
print (id(arr2))
```

```
[1 2 3 4 5]
[1 2 3 4 5]
2773572844720
2773572845936
```

In [ ]:
```
```