Creating Rank1 ndarray

an ndarray is a multidimensional array of elements all of the same type

can hold either numbers or strings

import statement

In [1]:
```
import numpy as np
```

array()--->ndarrays by providing Python lists to the NumPy np.array()

Not a CLASS #Just returns ndarray

In [2]:
```
x = np.array([1,2,3,4,5])
#Rank 1 arrays--------------------------- IMP ---------------------
print(type(x))
```

```
<class 'numpy.ndarray'>
```

.shape <----Attribute returns a tuple of possitive integer

.dtype <------- x are stored in memory as signed 64-bit integers.

In [3]:
```
print('x has dimensions:', x.shape)
print('x is an object of type:', str(type(x)))
print('The elements in x are of type:', x.dtype)
```

```
x has dimensions: (5,)
x is an object of type: <class 'numpy.ndarray'>
The elements in x are of type: int32
```

numpy array with all strings

In [4]:
```
y = np.array(['hello','world'])
```

In [5]:
```
print('y has dimensions:', y.shape)
print('y is an object of type:', type(y))
print('The elements in y are of type:', y.dtype)
```

```
y has dimensions: (2,)
y is an object of type: <class 'numpy.ndarray'>
The elements in y are of type: <U5
```

In [6]:
```
# We create a rank 2 ndarray that only contains integers
Y = np.array([[1,2,3],[4,5,6],[7,8,9], [10,11,12]])

# We print Y
print()
print('Y = \n', Y)
print()

# We print information about Y
print('Y has dimensions:', Y.shape)
print('Y has a total of', Y.size, 'elements')
```

```
print('Y is an object of type:', type(Y))
print('The elements in Y are of type:', Y.dtype)
```

```
Y =
 [[ 1  2  3]
 [ 4  5  6]
 [ 7  8  9]
 [10 11 12]]

Y has dimensions: (4, 3)
Y has a total of 12 elements
Y is an object of type: <class 'numpy.ndarray'>
The elements in Y are of type: int32
```

Creating np array with integers and strings

NOTE:::: The array will be saved as str ----------> integer will be converted to string U21

In [7]:
```
z = np.array(['Nitin',1,2])
print(z.dtype)
print(z)
```

```
<U5
['Nitin' '1' '2']
```

Creating rank 2 ndarray from a nested Python list.

rank2 ndarray that has only integers

.shape,.size,.type,.dtype

In [8]:
```
a = np.array([[1,2,3],[4,5,6],[7,8,9]])
```

```
print(a)
```

```
[[1 2 3]
 [4 5 6]
 [7 8 9]]
```

In [9]:
```
print("a has dimensions:",a.shape)
print("a has size of:",a.size,"elements")
print("a is an object of type:",type(a))
print("elements in obeject a are of type",a.dtype)
```

```
a has dimensions: (3, 3)
a has size of: 9 elements
a is an object of type: <class 'numpy.ndarray'>
elements in obeject a are of type int32
```

ndarray containing int and float will be converted to float

upcasting

In [10]:
```
b = np.array([1, 2.5, 4])
print(z)
print("elements in b are of type:",b.dtype)
```

```
['Nitin' '1' '2']
elements in b are of type: float64
```

Defining upcasting (dtype = np.int64)

In [11]:
```
c = np.array([1.2,3.8,4.03,2.1], dtype = np.int64)
print(c)
```

```
[1 3 4 2]
```