```python
import numpy as np

x = np.array([1, 5, 8])

type(x)

numpy.ndarray

x

array([1, 5, 8])

np.linspace(1,10,4, retstep = False)

array([ 1.,  4.,  7., 10.])

np.ones((3,4))

array([[1., 1., 1., 1.],
       [1., 1., 1., 1.],
       [1., 1., 1., 1.]])

np.zeros((4,5))

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

np.arange(1,100,4)

array([ 1,  5,  9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, 61, 65,
       69, 73, 77, 81, 85, 89, 93, 97])

np.random.rand(7)

array([0.99470412, 0.10492044, 0.98200293, 0.91356402, 0.84903384,
       0.95098628, 0.56741716])

np.random.rand(3,4)

array([[0.45449857, 0.99677595, 0.32097892, 0.31992289],
       [0.49607894, 0.39695232, 0.17310277, 0.42327928],
       [0.61565135, 0.07355489, 0.38823952, 0.72326733]])

y = range(1000)

timeit (sum(y))

14.3 µs ± 433 ns per loop (mean ± std. dev. of 7 runs, 10000 loops each)

x = np.array(x)
```

```
timeit(np.sum(x))
```

3.74 µs ± 90.9 ns per loop (mean ± std. dev. of 7 runs, 100000 loops each)

```
import sys
```

```
sys.getsizeof(1)*len(y)
```

28000

```
x.itemsize*x.size
```

24

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

```
a
```

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

```
a.shape
```

(3, 3)

```
h = np.array([[1,5,3],[4,5,6],[7,5,9]])
```

```
h
```

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

```
h.shape
```

(3, 3)

```
np.add(a,h)
```

```
array([[ 2,  7,  6],
       [ 8, 10, 12],
       [14, 13, 18]])
```

```
np.subtract(a,h)
```

```
array([[ 0, -3,  0],
       [ 0,  0,  0],
       [ 0,  3,  0]])
```

```
np.multiply(a,h)
```

```python
array([[ 1, 10,  9],
       [16, 25, 36],
       [49, 40, 81]])

a[1,:]

array([4, 5, 6])

a[1:3]

array([[4, 5, 6],
       [7, 8, 9]])

a[0,:]

array([1, 2, 3])

np.transpose(a)

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

a = range(10)

sum(a)

45

a

range(0, 10)

h

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

d = np.array([[7,8,9]]).reshape(3,1)

h = np.insert(h,2,d,axis = 1)

h

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