Array Slicing

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

```
In [ ]: x=np.arange(20).reshape(4,5)
        print(x)
        a=x[:2,:2]
        print(a)
        a=x[1:3,:]
        print(a)
        a=x[1:3,2:3]
        print(a)
        a=x[1:3,2:3]
        print(a)
```

```
[[ 0  1  2  3  4]
 [ 5  6  7  8  9]
 [10 11 12 13 14]
 [15 16 17 18 19]]
[[0 1]
 [5 6]]
[[ 5  6  7  8  9]
 [10 11 12 13 14]]
[[ 7]
 [12]]
```

Assigning sliced list to a variable and problem [Copy Function]

array assignment follow shallow copy

```
In [ ]: x=np.arange(20).reshape(4,5)
        print(x)
        y=x[1:3,1:3]
        print(y)
        # changing the variable y also affects variable x
        y[0,1]=-9
        print(x)
        print(y)
        # in order to create an independant variable using list slicing use copy() function
```

```
[[ 0  1  2  3  4]
 [ 5  6  7  8  9]
 [10 11 12 13 14]
 [15 16 17 18 19]]
[[ 6  7]
 [11 12]]
[[ 0  1  2  3  4]
 [ 5  6 -9  8  9]
 [10 11 12 13 14]
 [15 16 17 18 19]]
[[ 6 -9]
 [11 12]]
```

```
In [ ]: # Method 1 to use copy function
        x=np.arange(20).reshape(4,5)
```

```
y=np.copy(x[2:3,:])
print(y)
y[0,2]=99
print(y)
print(x)
```

```
[[10 11 12 13 14]]
[[10 11 99 13 14]]
[[ 0  1  2  3  4]
 [ 5  6  7  8  9]
 [10 11 12 13 14]
 [15 16 17 18 19]]
```

In [ ]:
```
# Method 2 to use copy function
x=np.arange(20).reshape(4,5)
y=x[2:3,:].copy()
print(y)
y[0,2]=99
print(y)
print(x)
```

```
[[10 11 12 13 14]]
[[10 11 99 13 14]]
[[ 0  1  2  3  4]
 [ 5  6  7  8  9]
 [10 11 12 13 14]
 [15 16 17 18 19]]
```

Diag Function

In [ ]:
```
# 0 means main diagonal
# k<0 means bellow main diagonal
# k>0 means above main diagonal
x=np.arange(25).reshape(5,5)
print(x)
y=np.diag(x,0)
print("Elements of Main Diaognal are\n",y)
y=np.diag(x,1)
print("Elements Above Main Diaognal are\n",y)
y=np.diag(x,-1)
print("Elements Bellow Main Diaognal are\n",y)
```

```
[[ 0  1  2  3  4]
 [ 5  6  7  8  9]
 [10 11 12 13 14]
 [15 16 17 18 19]
 [20 21 22 23 24]]
Elements of Main Diaognal are
 [ 0  6 12 18 24]
Elements Above Main Diaognal are
 [ 1  7 13 19]
Elements Bellow Main Diaognal are
 [ 5 11 17 23]
```