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EDS Practical no.3

[ ]:
```
import numpy as np
array1 = np.array([[1,2,3],[4,5,6],[7,8,9]])
array1
```

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

[ ]:
```
array2 = np.array([[11,12,13],[14,15,16],[17,18,19]])
array2
```

[ ]:
```
array([[11, 12, 13],
       [14, 15, 16],
       [17, 18, 19]])
```

[ ]:
```
resultarray = array1+array2
print(resultarray)
resultarray = np.add(array1,array2)
print("\n",resultarray)
```

```
[[12 14 16]
 [18 20 22]
 [24 26 28]]

 [[12 14 16]
 [18 20 22]
 [24 26 28]]
```

[ ]:
```
resultarray = array1-array2
print(resultarray)
```

```
[[-10 -10 -10]
 [-10 -10 -10]
 [-10 -10 -10]]
```

[ ]:
```
resultarray = array1*array2
print(resultarray)
```

```
[[ 11  24  39]
 [ 56  75  96]
 [119 144 171]]
```

[ ]:
```
resultarray = array1/array2
print(resultarray)
```

```
[[0.09090909 0.16666667 0.23076923]
 [0.28571429 0.33333333 0.375     ]
 [0.41176471 0.44444444 0.47368421]]
```

[ ]:
```
resultarray = array1%array2
print(resultarray)
```

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

[ ]:
```
resultarray = np.dot(array1,array2)
print(resultarray)
```

```
[[ 90  96 102]
 [216 231 246]
 [342 366 390]]
```

[ ]:
```
resultarray = np.transpose(array1)
print(resultarray)
```

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

[ ]:
```
resultarray = np.hstack((array1,array2))
print(resultarray)
```

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

[ ]:
```
resultarray = np.vstack((array1,array2))
print(resultarray)
```

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

[ ]:
```
arrayrange = np.arange(0,12,1).reshape(3,4)
print(arrayrange)
```

```
[[ 0  1  2  3]
 [ 4  5  6  7]
 [ 8  9 10 11]]
```

[ ]:
```
arrayrange = np.linspace(0,24,12)
print(arrayrange)
```

```
[ 0.          2.18181818  4.36363636  6.54545455  8.72727273 10.90909091
 13.09090909 15.27272727 17.45454545 19.63636364 21.81818182 24.        ]
```

[ ]:
```
arrayrange = np.empty((3,3),int)
print(arrayrange)
```

```
[[ 90  96 102]
 [216 231 246]
 [342 366 390]]
```

[ ]:
```
arrayrange = np.empty_like(array1)
print(arrayrange)
```

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

[ ]:
```
arrayrange = np.identity(3)
print(arrayrange)
```

```
[[1. 0. 0.]
 [0. 1. 0.]
 [0. 0. 1.]]
```

[ ]:
```
array1 = np.array([1,2,3,4,5])
array2 = ([11,12,13,14,15])
print(array1)
print(array2)
```

```
[1 2 3 4 5]
[11, 12, 13, 14, 15]
```

[ ]:
```
print(np.add(array1,array2))
print(np.subtract(array1,array2))
print(np.multiply(array1,array2))
print(np.divide(array1,array2))
```

```
[12 14 16 18 20]
```

```
[-10 -10 -10 -10 -10]
[11 24 39 56 75]
[0.09090909 0.16666667 0.23076923 0.28571429 0.33333333]
```

[ ]:
```
array1 = np.array([1,2,3,4,5,6,7,8,9])
print(np.std(array1))
print(np.min(array1))
print(np.sum(array1))
print(np.median(array1))
print(np.max(array1))
print(np.mean(array1))
```

```
2.581988897471611
1
45
5.0
9
5.0
```

[ ]:
```
array1 = np.array([1,2,3],dtype=np.uint8)
array2 = np.array([4,5,6])
result1 = np.bitwise_and(array1,array2)
print(result1)
result = np.bitwise_or(array1,array2)
print(result)
result = np.left_shift(array1,2)
print(result)
result = np.right_shift(array1,2)
print(result)
```

```
[0 0 2]
[5 7 7]
[ 4  8 12]
[0 0 0]
```

[ ]:
```
print(np.binary_repr(10,8))
result = np.left_shift(10,2)
print(result)
print(np.binary_repr(np.left_shift(10,2),8))
```

```
00001010
40
00101000
```

[ ]:
```
array1 = np.arange(1,10)
print(array1)
new = array1.copy()
print(new)
```

```
array1[0] = 100
print(array1)
print(new)
```

```
[1 2 3 4 5 6 7 8 9]
[1 2 3 4 5 6 7 8 9]
[100   2   3   4   5   6   7   8   9]
[1 2 3 4 5 6 7 8 9]
```

[ ]:
```
array1 = np.arange(1,10)
print(array1)
new = array1.view()
print(new)
array1[0] = 100
print(array1)
print(new)
```

```
[1 2 3 4 5 6 7 8 9]
[1 2 3 4 5 6 7 8 9]
[100   2   3   4   5   6   7   8   9]
[100   2   3   4   5   6   7   8   9]
```

[ ]:
```
array1 = np.array([[1,2,3,4,5,6],[18,14,19,20,55,60],[21,40,23,30,25,26]])
print(array1)
```

```
[[ 1  2  3  4  5  6]
 [18 14 19 20 55 60]
 [21 40 23 30 25 26]]
```

[ ]:
```
np.sort(array1,axis=0)
```

[ ]:
```
array([[ 1,  2,  3,  4,  5,  6],
       [18, 14, 19, 20, 25, 26],
       [21, 40, 23, 30, 55, 60]])
```

[ ]:
```
np.sort(array1,axis=1)
```

[ ]:
```
array([[ 1,  2,  3,  4,  5,  6],
       [14, 18, 19, 20, 55, 60],
       [21, 23, 25, 26, 30, 40]])
```

[ ]:
```
array1 = np.array([70,6,10,48,72,55])
np.searchsorted(array1,7,side='left')
```

[ ]:
```
2
```

[ ]:
```
array1 = np.array([1,0,3,4,0,6,7,8])
print(np.count_nonzero(array1))
print(np.nonzero(array1))
print(array1.size)
```

```
6
(array([0, 2, 3, 5, 6, 7]),)
8
```

[ ]:
```
array1 = np.array(np.arange(1,5).reshape(2,2))
print(array1)
array2 = np.array(np.arange(11,15).reshape(2,2))
print(array2)
```

```
[[1 2]
 [3 4]]
[[11 12]
 [13 14]]
```

[ ]:
```
new = np.stack([array1,array2],axis=0)
print(new)
```

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

 [[11 12]
  [13 14]]]
```

[ ]:
```
new = np.stack([array1,array2],axis=1)
print(new)
```

```
[[[ 1  2]
  [11 12]]

 [[ 3  4]
  [13 14]]]
```

[ ]:
```
array1 = np.array(np.arange(1,10).reshape(3,3))
print(array1)
array2 = np.array(np.arange(21,30).reshape(3,3))
print(array2)
```

```
[[1 2 3]
 [4 5 6]
 [7 8 9]]
[[21 22 23]
 [24 25 26]
 [27 28 29]]
```

[ ]:
```
np.append(array1,array2,axis=0)
```

[ ]:
```
array([[ 1,  2,  3],
       [ 4,  5,  6],
       [ 7,  8,  9],
       [21, 22, 23],
       [24, 25, 26],
       [27, 28, 29]])
```

[ ]:
```
np.append(array1,array2,axis=1)
```

[ ]:
```
array([[ 1,  2,  3, 21, 22, 23],
       [ 4,  5,  6, 24, 25, 26],
       [ 7,  8,  9, 27, 28, 29]])
```

[ ]:
```
np.concatenate((array1,array2),axis=0)
```

[ ]:
```
array([[ 1,  2,  3],
       [ 4,  5,  6],
       [ 7,  8,  9],
       [21, 22, 23],
       [24, 25, 26],
       [27, 28, 29]])
```

[ ]:
```
np.concatenate((array1,array2),axis=1)
```

[ ]:
```
array([[ 1,  2,  3, 21, 22, 23],
       [ 4,  5,  6, 24, 25, 26],
       [ 7,  8,  9, 27, 28, 29]])
```

[ ]:
```
array1 = np.loadtxt("testmarks1.csv",delimiter=",",skiprows=1)
print(type(array1))
array1.shape
```

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

[ ]:
```
(10, 5)
```

[ ]:
```
EDS = array1[:,1]
print(EDS)
```

```
[43.05 43.47 42.24 39.24 40.9  39.47 41.68 42.19 44.75 46.95]
```

[ ]:
```
SON = array1[:,2]
print(SON)
```

```
[27.79 28.52 28.16 26.16 26.03 26.31 25.63 27.61 28.35 28.88]
```