■ 입출력

● loadtxt : Text 형식의 데이터를 읽어오는 기능

```
a = np.loadtxt('./mabang1.txt')
a
```

```
array([[15.,  8.,  1., 24., 17.],
       [16., 14.,  7.,  5., 23.],
       [22., 20., 13.,  6.,  4.],
       [ 3., 21., 19., 12., 10.],
       [ 9.,  2., 25., 18., 11.]])
```

```
b = np.loadtxt('./mabang1.txt', np.int)
b
```

```
array([[15,  8,  1, 24, 17],
       [16, 14,  7,  5, 23],
       [22, 20, 13,  6,  4],
       [ 3, 21, 19, 12, 10],
       [ 9,  2, 25, 18, 11]])
```

```
a[1:-1, 1:-1]
```

```
array([[14.,  7.,  5.],
       [20., 13.,  6.],
       [21., 19., 12.]])
```

```
b[1:-1, 1:-1]
```

```
array([[14,  7,  5],
       [20, 13,  6],
       [21, 19, 12]])
```

mabang1.txt

15	8	1	24	17
16	14	7	5	23
22	20	13	6	4
3	21	19	12	10
9	2	25	18	11

■ 입출력

● loadtxt : Text 형식의 데이터를 읽어오는 기능

```
c = np.loadtxt('mabang2.txt', dtype=np.str)
c
```

```
array([['15,', '8,', '1,', '24,', '17,'],
       ['16,', '14,', '7,', '5,', '23,'],
       ['22,', '20,', '13,', '6,', '4,'],
       ['3,', '21,', '19,', '12,', '10,'],
       ['9,', '2,', '25,', '18,', '11,']], dtype='<U3')
```

```
c = np.loadtxt('mabang2.txt', dtype=np.str, delimiter=', ')
c
```

```
array([['15', '8', ' 1', ' 24', '17'],
       ['16', '14', '7', ' 5', ' 23'],
       ['22', '20', '13', '6', ' 4'],
       ['3', ' 21', '19', '12', '10'],
       ['9', ' 2', ' 25', '18', '11']], dtype='<U3')
```

```
c = c.astype(np.int)
c
```

```
array([[15,  8,  1, 24, 17],
       [16, 14,  7,  5, 23],
       [22, 20, 13,  6,  4],
       [ 3, 21, 19, 12, 10],
       [ 9,  2, 25, 18, 11]])
```

mabang2.txt

```
15, 8,  1,  24, 17
16, 14, 7,  5,  23
22, 20, 13, 6,  4
3,  21, 19, 12, 10
9,  2,  25, 18, 11
```

■ 입출력

● savetxt : 데이터를 Text 형식으로 저장하는 기능

– 기본 저장

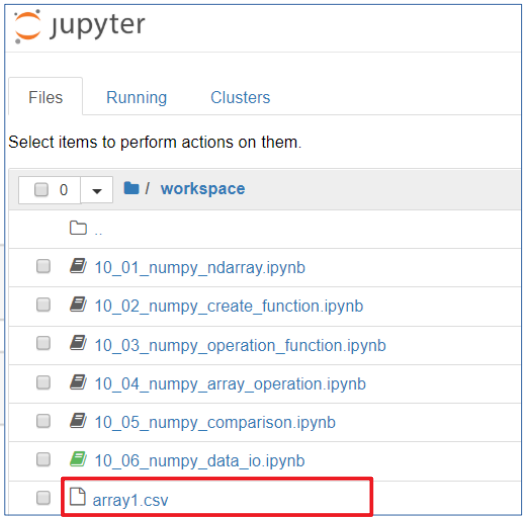
```
d = np.arange(1, 26).reshape(5, 5)
d
```

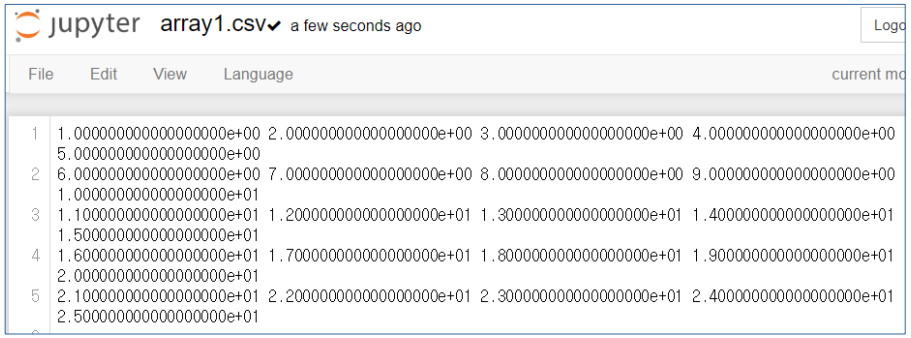
```
array([[ 1,  2,  3,  4,  5],
       [ 6,  7,  8,  9, 10],
       [11, 12, 13, 14, 15],
       [16, 17, 18, 19, 20],
       [21, 22, 23, 24, 25]])
```

```
np.savetxt('array1.csv', d)  # 기본 사용
```

```
np.loadtxt('array1.csv')
```

```
array([[ 1.,  2.,  3.,  4.,  5.],
       [ 6.,  7.,  8.,  9., 10.],
       [11., 12., 13., 14., 15.],
       [16., 17., 18., 19., 20.],
       [21., 22., 23., 24., 25.]])
```





■ 입출력

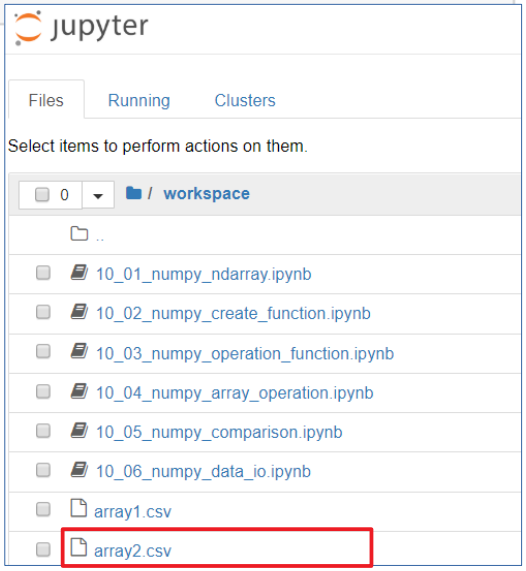
● savetxt : 데이터를 Text 형식으로 저장하는 기능

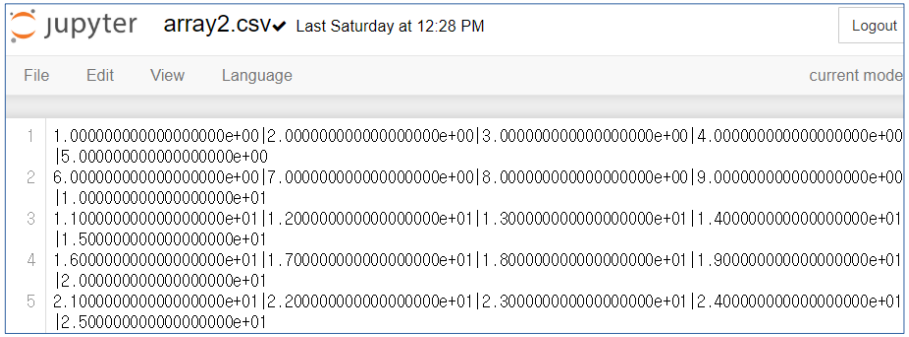
- 구분자 지정 저장 (delimiter)

```
np.savetxt('array2.csv', d, delimiter='|')  # delimiter 구분자 지정
```

```
np.loadtxt('array2.csv', delimiter='|')
```

```
array([[ 1.,  2.,  3.,  4.,  5.],
       [ 6.,  7.,  8.,  9., 10.],
       [11., 12., 13., 14., 15.],
       [16., 17., 18., 19., 20.],
       [21., 22., 23., 24., 25.]])
```





■ 입출력

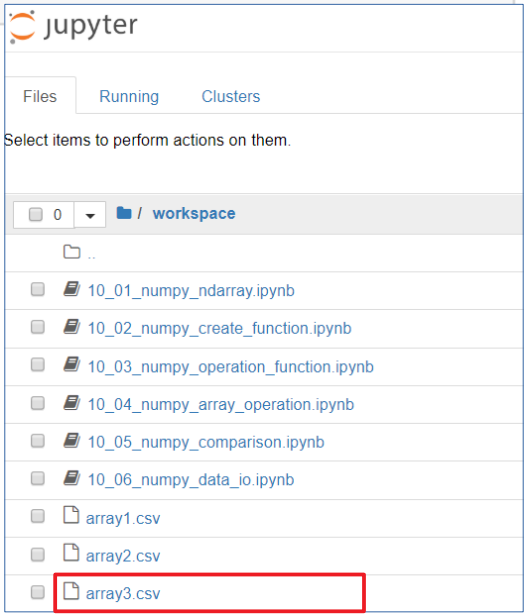
● savetxt : 데이터를 Text 형식으로 저장하는 기능

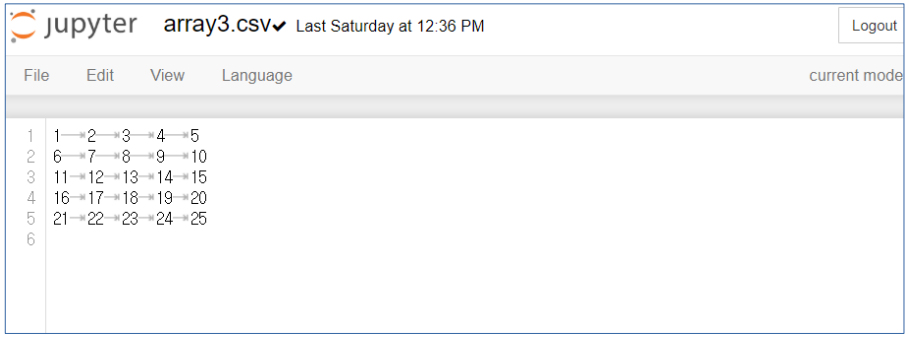
- 데이터 형식 지정 저장 (fmt)

```
np.savetxt('array3.csv', d, delimiter='₩t', fmt='%i')  # type 지정
```

```
np.loadtxt('array3.csv', dtype=np.str)
```

```
array([['1', '2', '3', '4', '5'],
       ['6', '7', '8', '9', '10'],
       ['11', '12', '13', '14', '15'],
       ['16', '17', '18', '19', '20'],
       ['21', '22', '23', '24', '25']], dtype='<U2')
```





■ 입출력

● numpy object – npy

– save / load : Binary 형태로 저장

```
np.save('npy_data', arr=d)
```

```
np.load(file='npy_data.npy')
```

```
array([[ 1,  2,  3,  4,  5],
       [ 6,  7,  8,  9, 10],
       [11, 12, 13, 14, 15],
       [16, 17, 18, 19, 20],
       [21, 22, 23, 24, 25]])
```