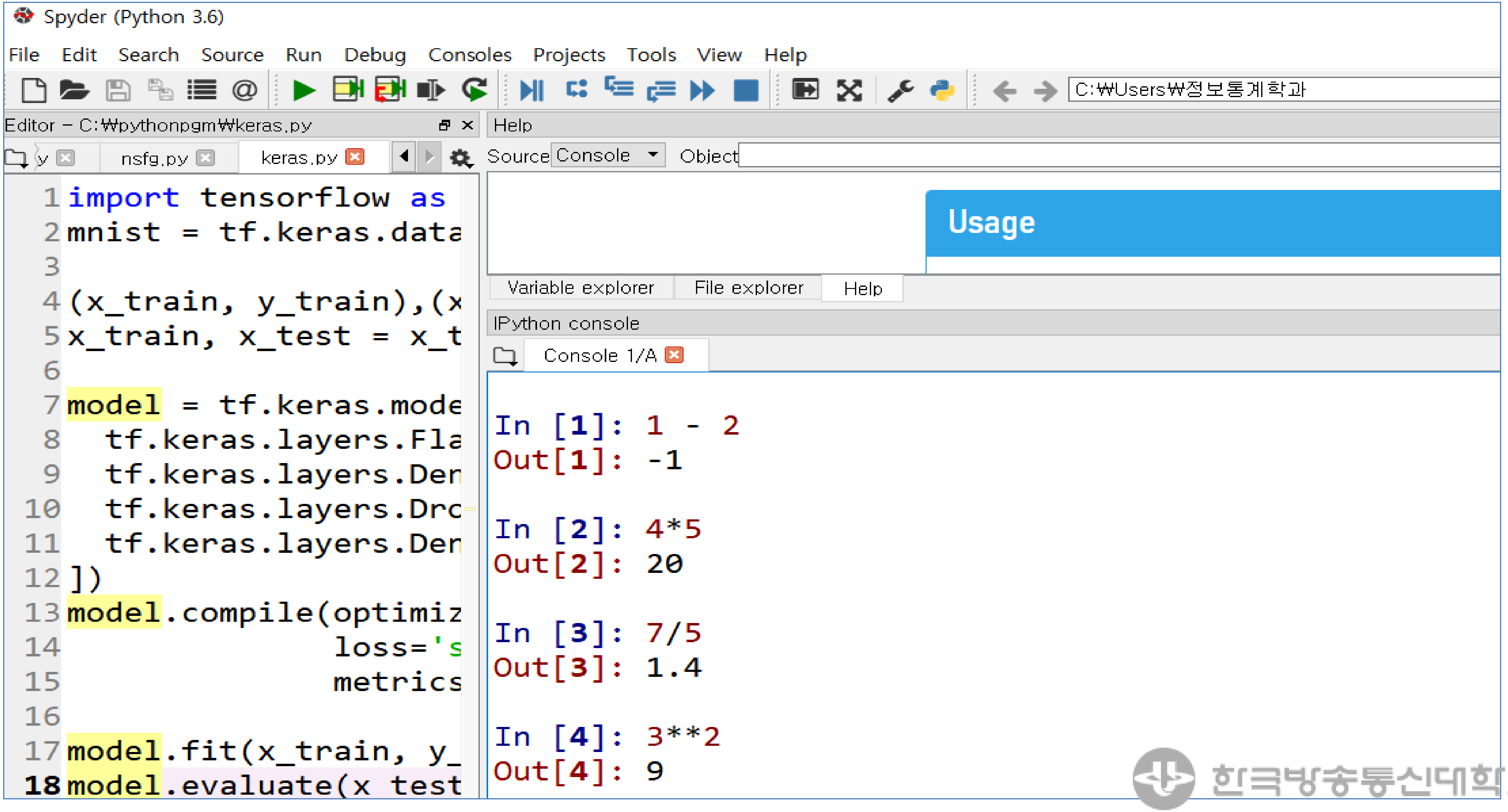
3강 파이썬 기초

참고문헌:

밑바닥부터 시작하는 Deep Learning ,한빛미디어,
사이토고키지음, 이복연 역, 2017

1) 산술연산



```
import tensorflow as
mnist = tf.keras.data

(x_train, y_train),(x
x_train, x_test = x_t

model = tf.keras.mode
  tf.keras.layers.Fla
  tf.keras.layers.Der
  tf.keras.layers.Drc
  tf.keras.layers.Der
])
model.compile(optimiz
              loss='s
              metrics
 
model.fit(x_train, y_
model.evaluate(x test
```

```
In [1]: 1 - 2
Out[1]: -1

In [2]: 4*5
Out[2]: 20

In [3]: 7/5
Out[3]: 1.4

In [4]: 3**2
Out[4]: 9
```

2) 자료형

```
type(10)    # int

type(2.710)   # float

type(“hello”)   # str
```

3) 변수

```
x = 10
print(x)
y = 3.14
x*y
type(x*y)    # float
```

4) 리스트

```
a = [1,2,3,4,5]
print(a)    # [1,2,3,4,5]
len(a)      #  5
a[0]        # 1
a[4]        # 5
a[4] = 99
print(a)    # [1,2,3,4,99]
a[0:2]      # [1,2]
a[1:]       # [2,3,4,99]
a[:3]       # [1,2,3]
a[:-1]      # [1,2,3,4]
a[:-2]      # [1,2,3]
```

5) Dictionary : key 와 value를 한 쌍으로 저장

```
me = {‘height’ : 180, ‘weight’: 70}
me[‘height’]      # 180
me[‘weight’]     # 70
me['age'] = 30  # 새 원소 추가
print(me)
{'height': 180, 'weight': 70, 'age': 30}
```

참고: 1장 desc0.py

```
import pandas as pd
import numpy as np
#Create a Dictionary of series
d = {'Name':pd.Series(['Tom','James','Ricky','Vin','Steve','Smith','Jack',
   'Lee','David','Gasper','Betina','Andres']),
   'Age':pd.Series([25,26,25,23,30,29,23,34,40,30,51,46]),
   'Rating':pd.Series([4.23,3.24,3.98,2.56,3.20,4.6,3.8,3.78,2.98,4.80,4.10,3.65])}
#Create a DataFrame
df = pd.DataFrame(d)
print (df)
df.head()
```

6) bool

```
hungry = True

sleepy = False

type(hungry)      # bool

not hungry        #  False

hungry and sleepy   # False

hungry or sleepy     # True
```

7) if

```
 hungry = True

 if hungry :
 ... :    print("I'm hungry")
 ... :
 I'm hungry

 hungry = False

if hungry :
... :  print("I'm hungry")
else:
... :  print("I'm not hungry")
... :  print("I'm sleepy")
... :
 I'm not hungry
 I'm sleepy
```

8) for : 반복문

```
for i in [1,2,3]:
    print(i)
```

```
1
2
3
```

```
name = ['a', 'b', 'c', 'd', 'e']
for i in name:
    print(i)
```

```
a
b
c
d
e
```

8) for : 반복문 - 계속

```
sum = 0
for i in range(10) :
    sum = sum+i

print(sum)
Out[10]: 45
```

Note that range(10) is not the value of 0 to 10, but the values 0 to 9

9) 함수

```
def hello():
    print("Hello World !")
    print("Welcome to Python class !")

hello()
Hello World !
Welcome to Python class !

def hello2(object):
    print("Hello " + object + " !")

hello2("Jang")
Hello Jang !
```

10) 클래스

```
class Man:
    def _ _init_ _(self, name):
        self.name = name
        print("Initialized !")
    def hello(self):
        print("Hello " + self.name + " !")
    def goodbye(self):
        print("Good-bye " + self.name + " !")

m = Man("David")
Initialized !

m.hello()
Hello David !
m.goodbye()
Good-bye David !
```

10) 클래스 – 계속1

```
class Person:
    def __init__(self, name, age):
        self.name=name
        self.age=age
    def disp(self):
        print(self.name)
        print(self.age)
p1=Person('홍길동', 22)
p2=Person('철수', 35)

p1.disp()
홍길동
22
p2.disp()
철수
35
```

10) 클래스 – 계속2

```
class Person2:
    def __init__(self):
        self.name=input('Name:')
        self.age=int(input('Age:'))
    def disprint(self):
        print('Name = ',self.name)
        print('Age =', self.age)

customer=[ ]
for i in range(5):
    customer.append(Person2())
```

```
Name:AAA
Age: 12
Name:BBB
Age:25
…
```

```
>>> customer[0].disprint()
AAA
12
>>> customer[1].disprint()
BBB
25
```

11) Numpy 가져오기

```
import numpy as np
x = np.array([1.0, 2.0, 3.0])
print(x)     # [1. 2. 3.]
type(x)     # numpy.ndarray

 y = x/3
 print(y)      # [0.33333333 0.66666667 1. ]

 x = np.array([1.0, 2.0, 3.0])
 y = np.array([2.0, 4.0, 6.0])
 x+y      # array([3., 6., 9.])
 x-y      # array([-1., -2., -3.])
 x*y      # array([ 2.,  8., 18.])
 x/y      # array([0.5, 0.5, 0.5])
```

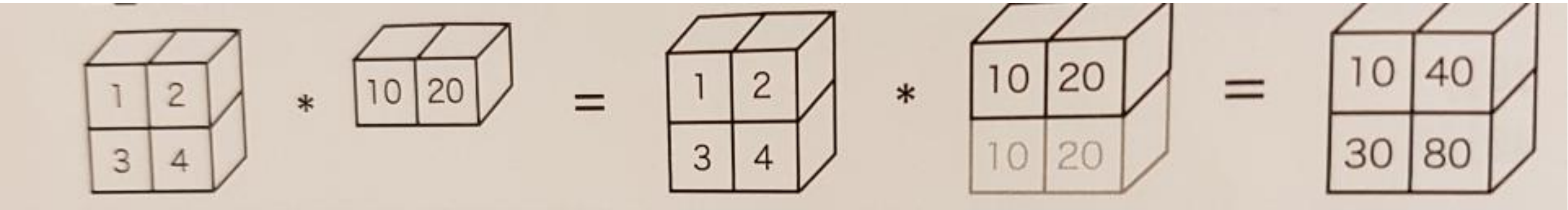
Numpy 이야기 : https://brunch.co.kr/@hvnpoet/88

12) Numpy – N차원 배열

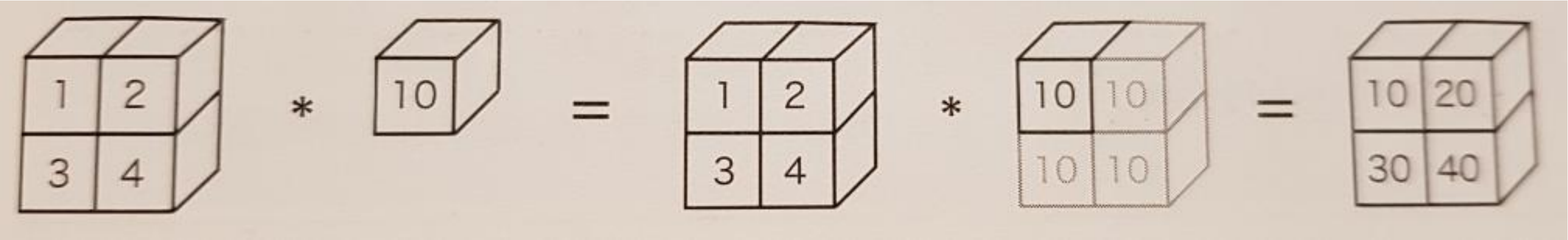
```
import numpy as np
A = np.array([[5,7], [9,11]])
print(A)
[[ 5   7]
[ 9 11]]
A[0]       # array([5, 7])
A[1]       # array([ 9, 11])
A[0,0]     #   5   - A[0][0]
A[1,0]     #   9   - A[1][0]
B = np.array([[3,0],[0,6]])
A+B
array([[ 8,   7],
        [ 9, 17]])
A*B
Out[63]:
    array([[15,   0],
            [ 0, 66]])
```

13) Broadcast : 형상이 다른 배열 계산

```
import numpy as np
A = np.array([[1,2], [3,4]])
B = np.array([10,20])
C = 10
A*B
Out[6]:
array([[10, 40],
       [30, 80]])
```



```
A*C
Out[8]:
array([[10, 20],
       [30, 40]])
```



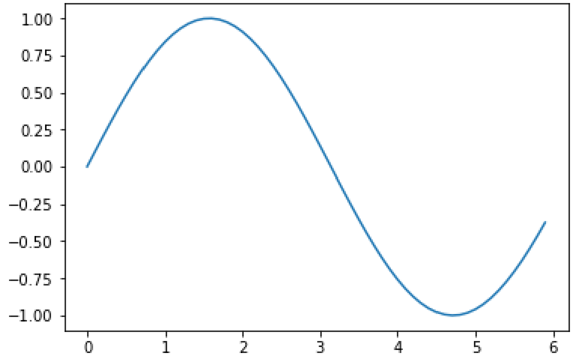
14) 원소 접근 : 원소의 인덱스는 0부터 시작

```
X = np.array([[51,55],[14,19],[0,4]])
print(X)
[[51 55]
 [14 19]
 [ 0  4]]

X[0]
Out[11]: array([51, 55])
X[0][1]
Out[12]: 55

for row in X:
...     print(row)
...
[51 55]
[14 19]
[0 4]
```

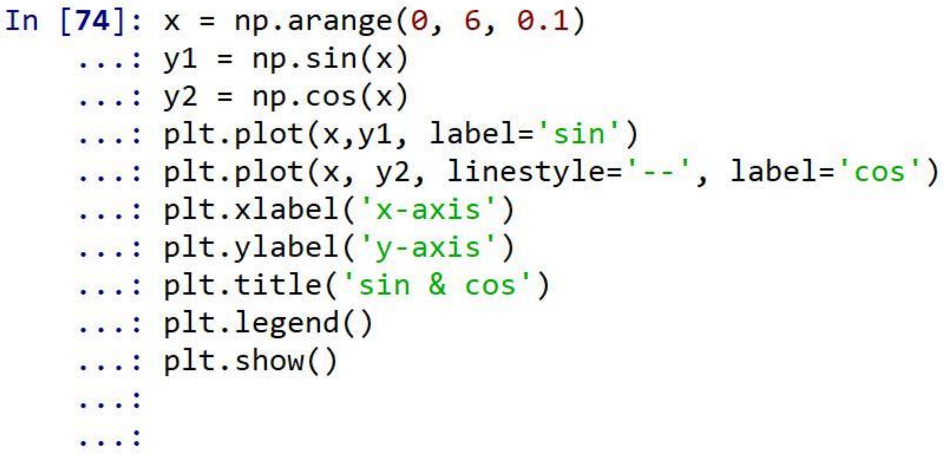
```
Y = X.flatten()
print(Y)
[51 55 14 19  0  4]

Y>15
Out[17]: array([ True,  True, False,  True, False, False])

Y[Y>15]
Out[18]: array([51, 55, 19])
```

15) matplotlib

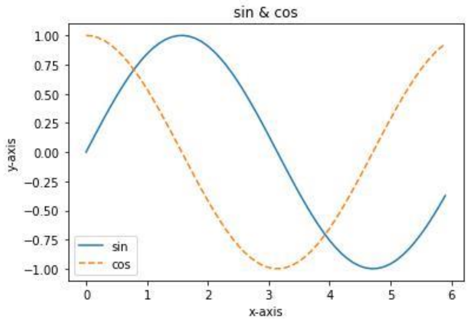
```
import matplotlib.pyplot as plt
x = np.arange(0, 6, 0.1)
y = np.sin(x)
plt.plot(x,y)
plt.show()
```



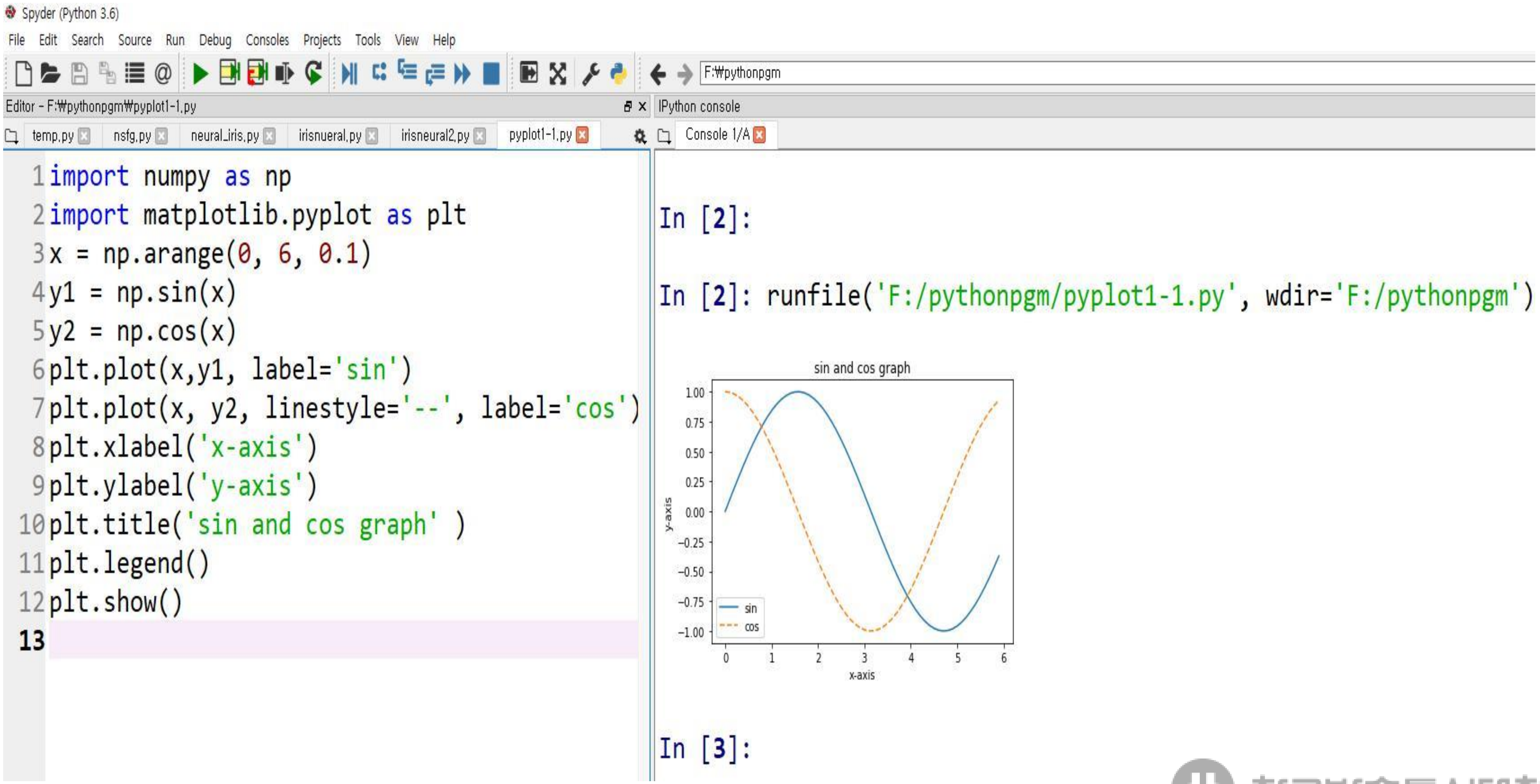
```
x = np.arange(0, 6, 0.1)
y1 = np.sin(x)
y2 = np.cos(x)
plt.plot(x,y1, label=‘sin’)
plt.plot(x, y2, linestyle=‘—’, label=‘cos’)
plt.xlabel(‘x-axis’)
plt.ylabel(“y-axis”)
plt.title(“sin & cos”)
plt.legend()
plt.show()
```



```
In [74]: x = np.arange(0, 6, 0.1)
    ...: y1 = np.sin(x)
    ...: y2 = np.cos(x)
    ...: plt.plot(x,y1, label='sin')
    ...: plt.plot(x, y2, linestyle='--', label='cos')
    ...: plt.xlabel('x-axis')
    ...: plt.ylabel('y-axis')
    ...: plt.title('sin & cos')
    ...: plt.legend()
    ...: plt.show()
    ...:
    ...:
```



16) 파이썬 scripts 파일



```python
import numpy as np
import matplotlib.pyplot as plt
x = np.arange(0, 6, 0.1)
y1 = np.sin(x)
y2 = np.cos(x)
plt.plot(x,y1, label='sin')
plt.plot(x, y2, linestyle='--', label='cos')
plt.xlabel('x-axis')
plt.ylabel('y-axis')
plt.title('sin and cos graph' )
plt.legend()
plt.show()
```

```
In [2]:

In [2]: runfile('F:/pythonpgm/pyplot1-1.py', wdir='F:/pythonpgm')

In [3]:
```

파이썬 배우기 - Youtube

Python for Beginner

https://www.python.org/about/gettingstarted/

The Python Guru

https://thepythonguru.com/

Learn Python

https://www.codecademy.com/learn/learn-python

Python - Install Anaconda, Jupyter Notebook, Spyder on Windows 10
Xperimental Learning • 조회수 28만회 • 2년 전
관련 자료

https://www.youtube.com/watch?v=Q0jGAZAdZqM

How to Install and Run Python Scripts
Sneaker Handbook • 조회수 1.3만회 • 1년 전
I hope I hit everything! If I did miss anything and you
don't usually check ...

https://www.youtube.com/watch?v=mrUPVI6UlIE

Installing and running Python 2 & 3 in Windows 10
LaunchCode • 조회수 3.8만회 • 2년 전
How to install **Python** 2 and **Python** 3 in Windows 10, and how to write
run them at the PowerShell ...

https://www.youtube.com/watch?v=3xp-ixFbDuE

Python for Beginners with Spyder IDE
APMonitor.com • 조회수 1.5만회 • 8개월 전
This introduction includes information about naming
built-in functions, syntax ...

https://www.youtube.com/watch?v=BdATXeUkKnw

참고문헌

Python

- Brian Heinold, A Practical Introduction to Python Programming, 2012.
- Edouard Duchesnay, Tommy Löfstedt. Statistics and Machine Learning in Python, 2018.

R

- W. J. Braun and D. J. Murdoch, A First Course in Statistical Programming with R. Cambridge University Press. 2008.
- M. J. Crawley, Statistics-An Introduction Using R. John Wiley & Sons, 2005.
- M. L. Rizzo, Statistical Computing with R. Chapman and Hall/CRC. 2007.