

[그래프 그리기 - matplotlib(2)]

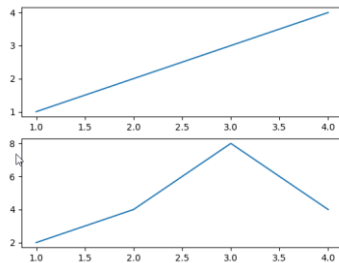
[한화면에 여러 그래프]

ex01.py

```
import matplotlib.pyplot as plt

plt.figure()
plt.subplot(2,1,1) #2행 1열 그래프의 첫번째 그래프
plt.plot([1,2,3,4],[1,2,3,4])

plt.subplot(2,1,2) #2행 1열 그래프의 두번째 그래프
plt.plot([1,2,3,4],[2,4,8,4])
plt.show()
```



ex02.py

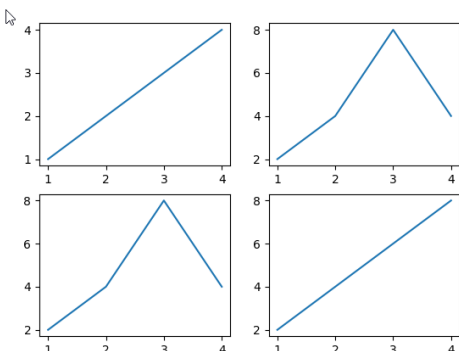
```
import matplotlib.pyplot as plt

plt.figure()
plt.subplot(2,2,1) #2행 2열 그래프의 첫번째 그래프
plt.plot([1,2,3,4],[1,2,3,4])

plt.subplot(2,2,2) #2행 2열 그래프의 두번째 그래프
plt.plot([1,2,3,4],[2,4,8,4])

plt.subplot(2,2,3) #2행 2열 그래프의 세번째 그래프
plt.plot([1,2,3,4],[2,4,8,4])

plt.subplot(2,2,4) #2행 2열 그래프의 네번째 그래프
plt.plot([1,2,3,4],[2,4,6,8])
plt.show()
```



ex03_bar.py < 막대 그래프 >

```

import matplotlib.pyplot as plt
import matplotlib
from matplotlib import font_manager, rc

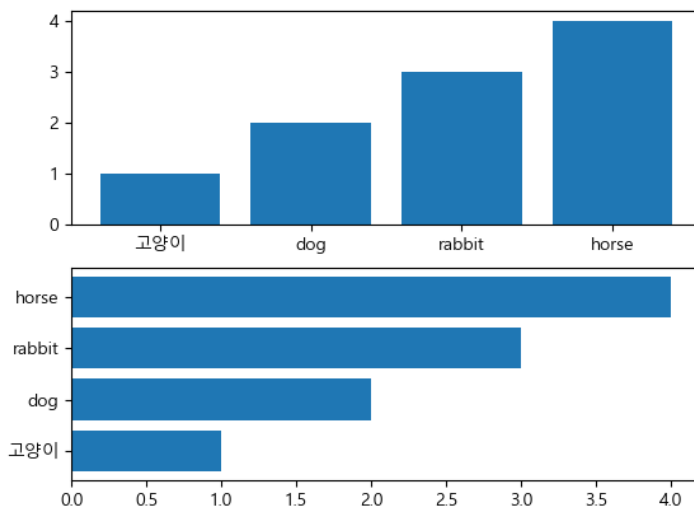
#한글 폰트 등록
font_location = "c:/Windows/fonts/malgun.ttf"
font_name = font_manager.FontProperties(fname=font_location).get_name()
matplotlib.rc('font', family=font_name)

animals = ('고양이', 'dog', 'rabbit', 'horse')
nums = (1, 2, 3, 4)

plt.figure()
plt.subplot(2,1,1)
plt.bar(animals, nums)

plt.subplot(2,1,2)
plt.barh(animals, nums)
plt.show()

```



ex04_bar.py

```

import matplotlib.pyplot as plt
import matplotlib
from matplotlib import font_manager, rc

#한글 폰트 등록
font_location = "c:/Windows/fonts/malgun.ttf"
font_name = font_manager.FontProperties(fname=font_location).get_name()
matplotlib.rc('font', family=font_name)

import pandas as pd
CCTV_Seoul = pd.read_csv("ex01_CCTV_in_Seoul.csv", encoding="utf-8")
CCTV_Seoul.rename(columns={CCTV_Seoul.columns[0] : '구별'}, inplace=True)
CCTV_Seoul.rename(columns={CCTV_Seoul.columns[1] : 'CCTV설치수_소계'}, inplace=True)

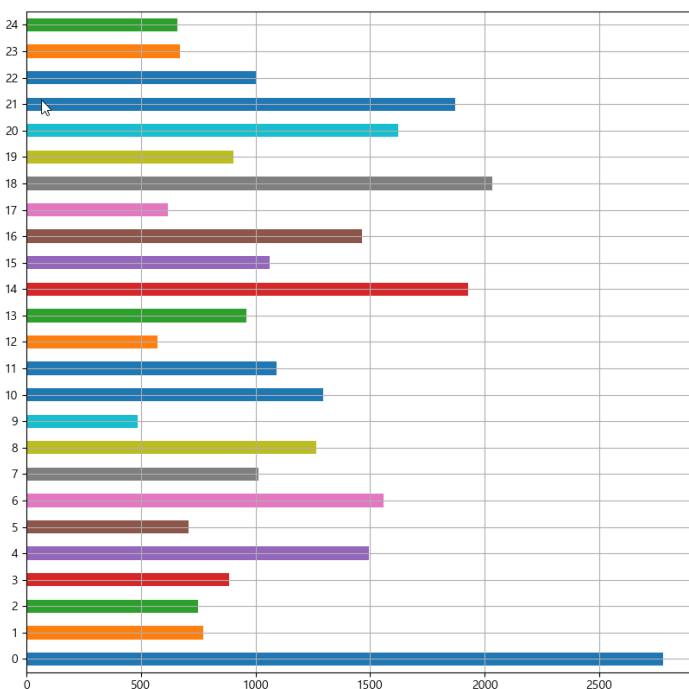
pop_Seoul = pd.read_excel('ex01_population_in_Seoul.xls',
                          header=2,
                          usecols='B, D, G, J, N',
                          encoding='utf-8')

pop_Seoul.rename(columns={pop_Seoul.columns[0] : '구별',
                          pop_Seoul.columns[1] : '인구수',
                          pop_Seoul.columns[2] : '한국인',
                          pop_Seoul.columns[3] : '외국인',
                          pop_Seoul.columns[4] : '고령자'}, inplace=True)

data_result = pd.merge(CCTV_Seoul, pop_Seoul, on='구별')
print(data_result.head())

#####
plt.figure()
data_result['CCTV설치수_소계'].plot(kind='barh', grid=True, figsize=(10,10))
plt.show()

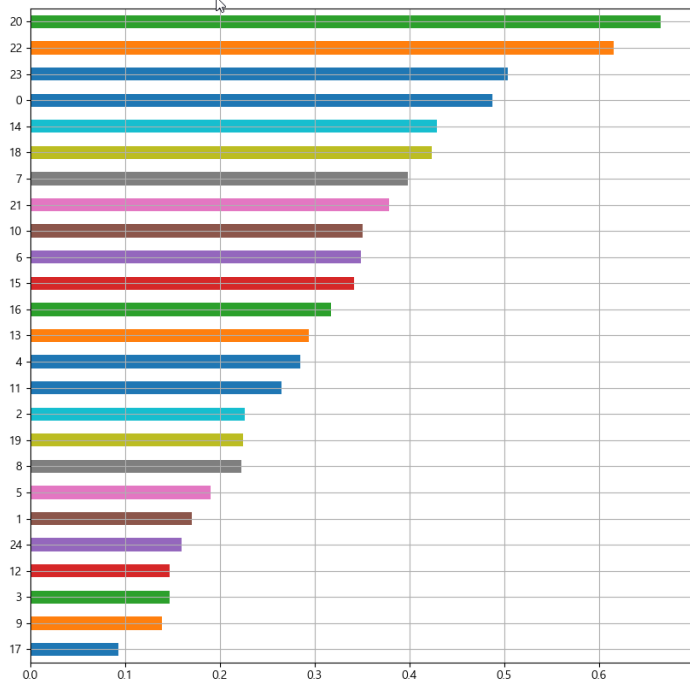
```



코드 계속

```
#####
data_result['CCTV설치수_소계'].sort_values().plot(kind='barh',
                                                    grid=True, figsize=(10,10))

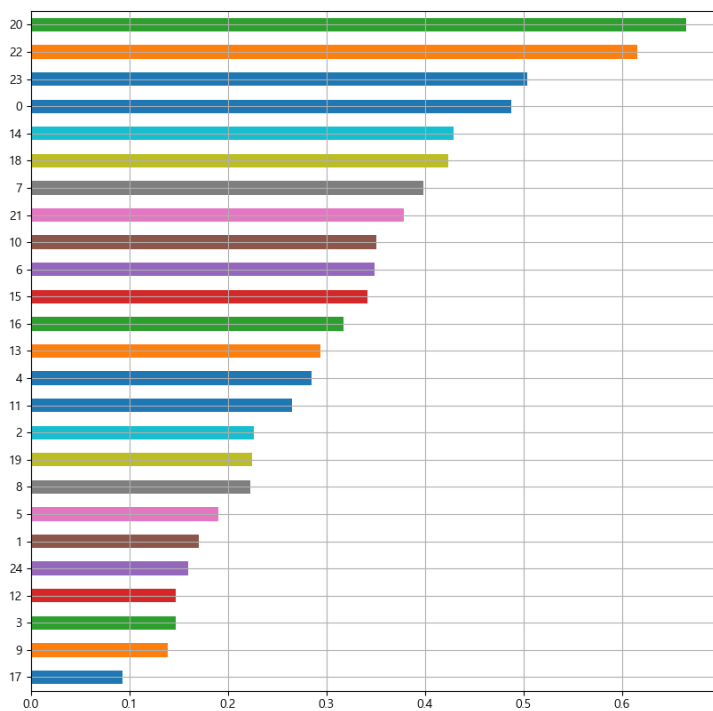
plt.show()
```



코드 계속

```
#####
data_result['CCTV비율'] = data_result['CCTV설치수_소계'] / data_result['인구수'] * 100
data_result['CCTV비율'].sort_values().plot(kind='barh',
                                                    grid=True, figsize=(10,10))

plt.show()
```



[그래프 그리기 – seaborn]

seaborn 은 matplotlib도 import 되어 있어야만 함.

ex05.py < 선 그래프 >

```
import matplotlib.pyplot as plt
import numpy as np
import seaborn as sns

x = np.linspace(0, 14, 100) #1부터 14까지 100개의 숫자 생성하여 리스트로 반환

y1 = np.sin(x)
y2 = 2*np.sin(x+0.5)
y3 = 3*np.sin(x+1.0)
y4 = 4*np.sin(x+1.5)

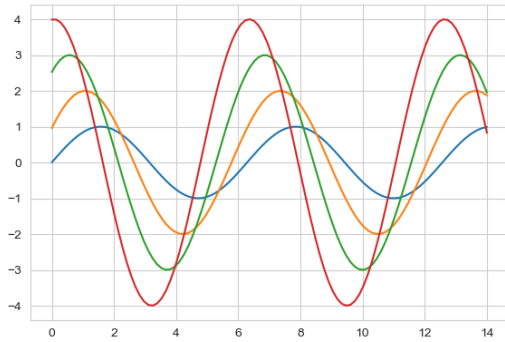
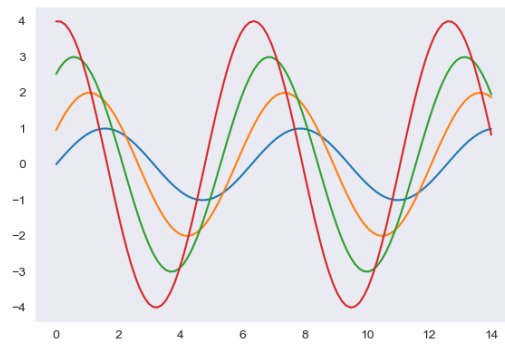
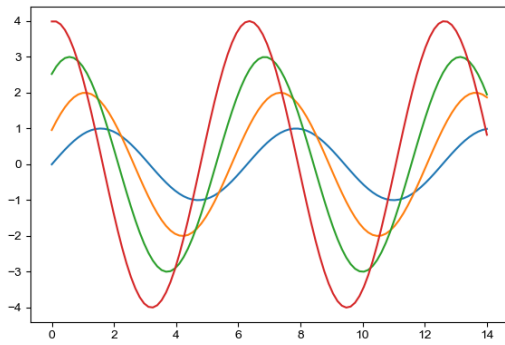
plt.figure(figsize=(15,10))

plt.subplot(2,2,1)
plt.plot(x,y1, x,y2, x,y3, x,y4)

sns.set_style("dark")
plt.subplot(2,2,2)
plt.plot(x,y1, x,y2, x,y3, x,y4)

sns.set_style("whitegrid")
plt.subplot(2,2,3)
plt.plot(x,y1, x,y2, x,y3, x,y4)

plt.show()
```



ex06_boxplot.py < boxplot 그래프 >

```
import matplotlib.pyplot as plt
import seaborn as sns

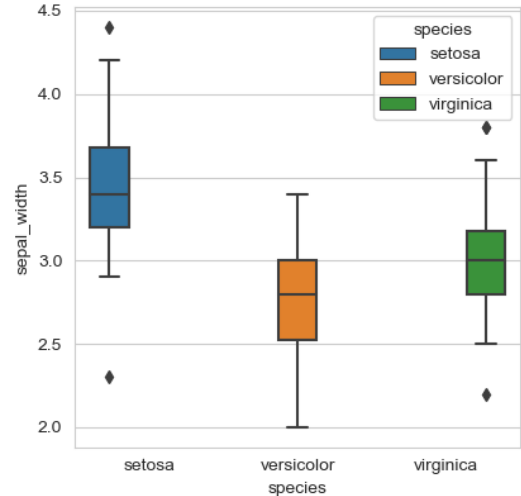
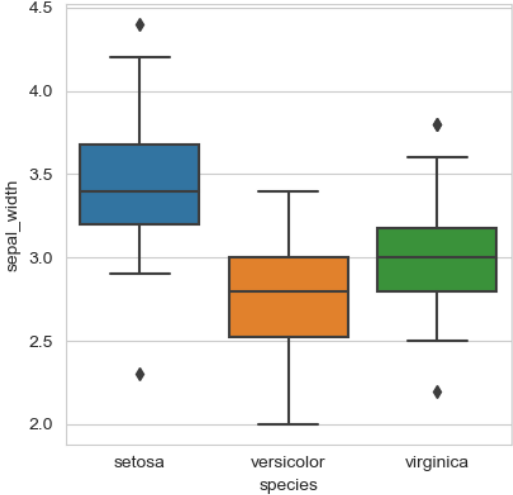
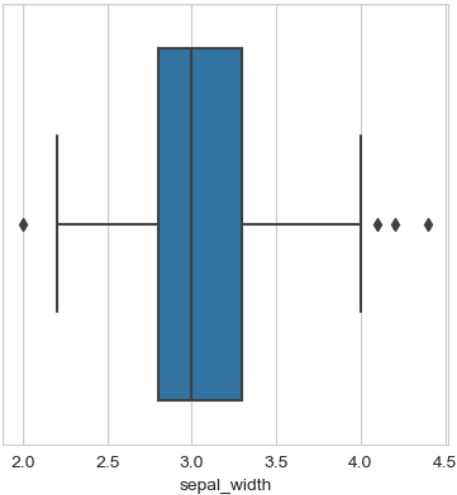
tips = sns.load_dataset("iris")_# seaborn 패키지의 샘플 데이터
print(_tips.head(5)_ )

plt.figure(figsize=(10,10))

sns.set_style("whitegrid")
plt.subplot(2,2,1)
sns.boxplot(x=tips["sepal_width"])

plt.subplot(2,2,2)
sns.boxplot(x="species", y="sepal_width", data=tips)

plt.subplot(2,2,3)
sns.boxplot(x="species", y="sepal_width", hue="species", data=tips)
plt.show()
```



< 산점도 그래프 > plt.scatter(...) 로 그릴 수도 있음

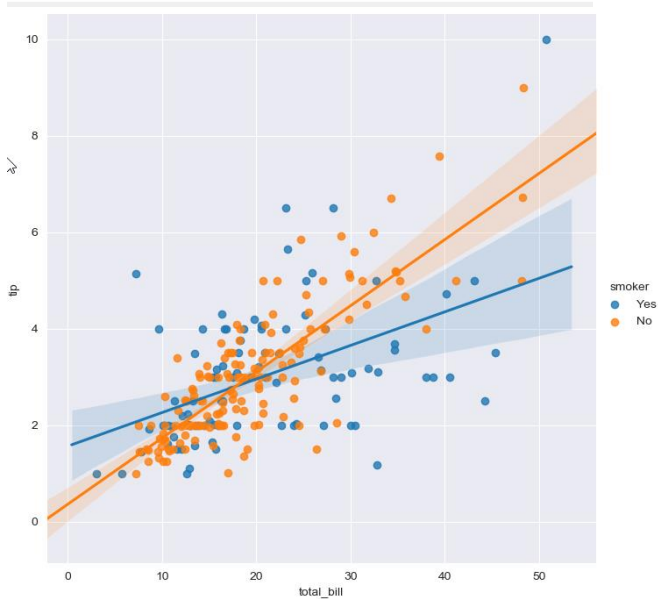
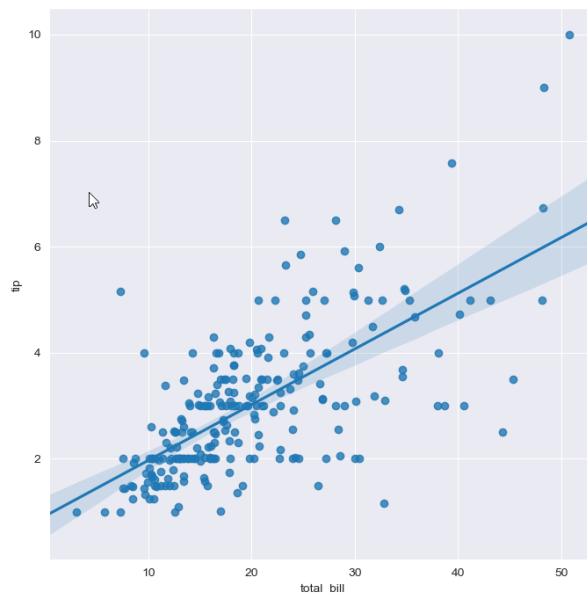
```
import matplotlib.pyplot as plt
import seaborn as sns

tips = sns.load_dataset("tips") # seaborn 패키지의 샘플 데이터
```

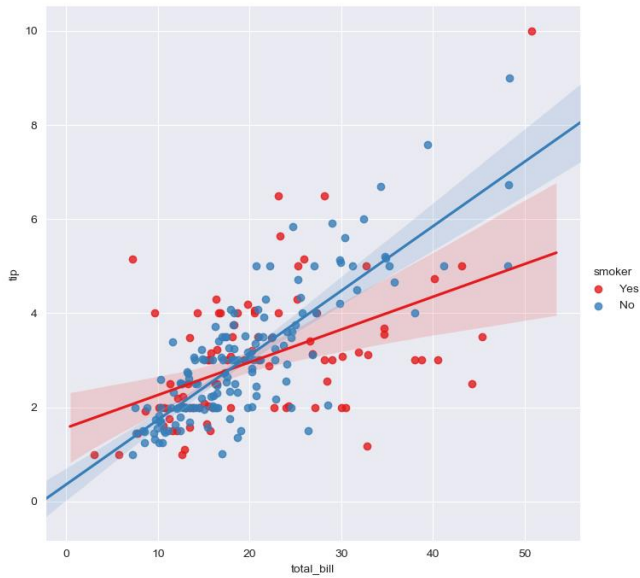
```
sns.set_style("darkgrid")
sns.lmplot(x="total_bill", y="tip", data=tips, size=7, )
plt.show()
```

```
sns.lmplot(x="total_bill", y="tip", hue="smoker", data=tips, size=7)
plt.show()
```

```
sns.lmplot(x="total_bill", y="tip", hue="smoker", data=tips, palette="Set1", size=7)
plt.show()
```



smoker 값에 따라 다른 색.

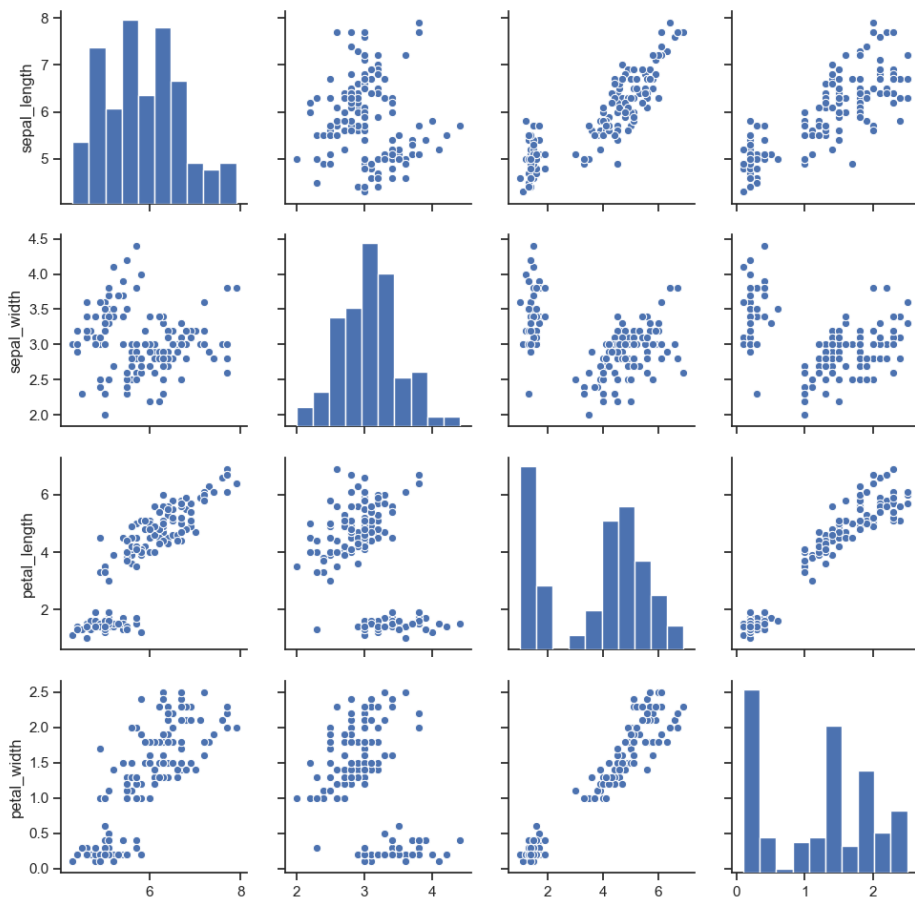


```
import matplotlib.pyplot as plt
import seaborn as sns

iris = sns.load_dataset("iris") # seaborn 패키지의 샘플 데이터

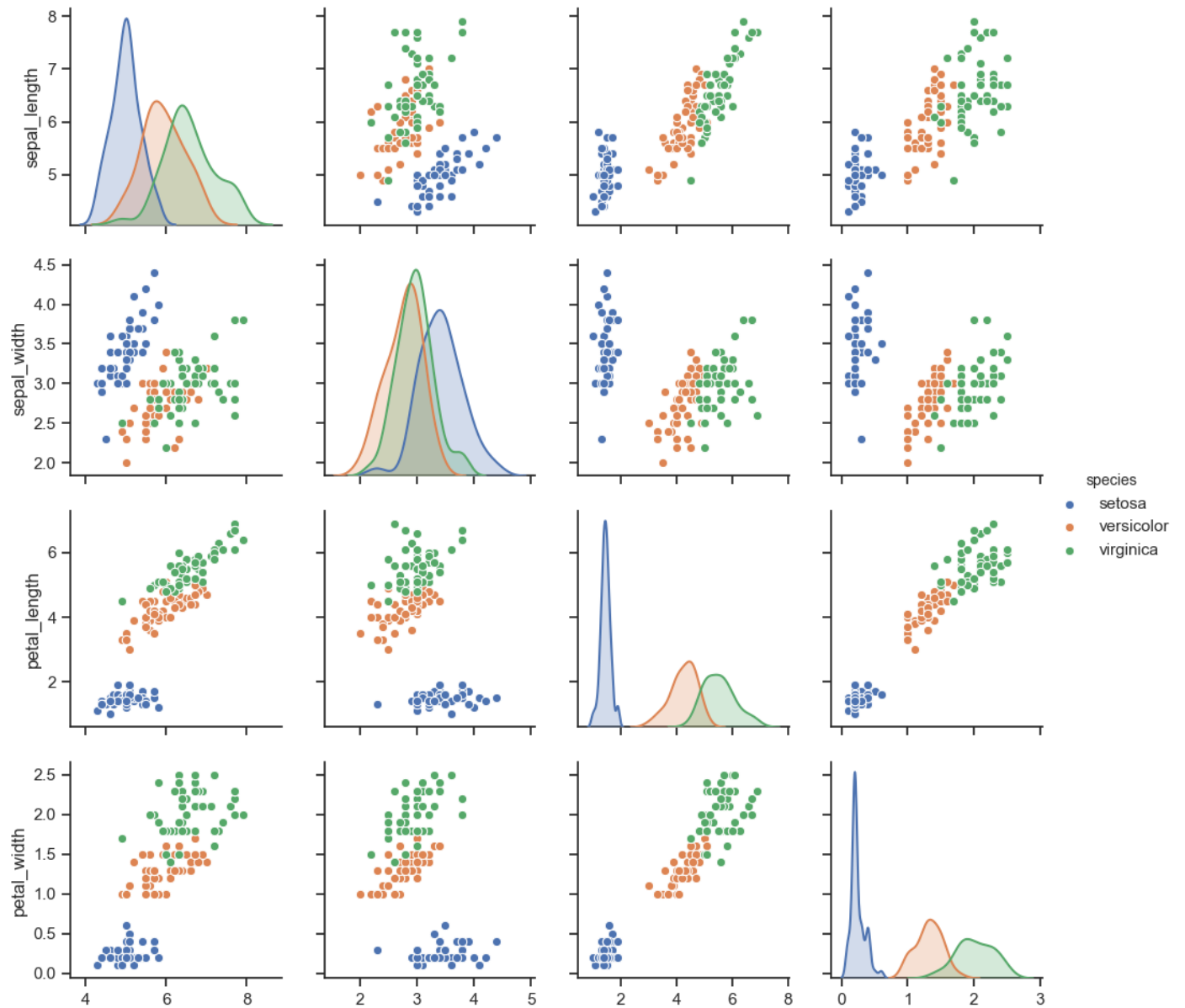
sns.set(style="ticks")

sns.pairplot(iris)
plt.show()
```



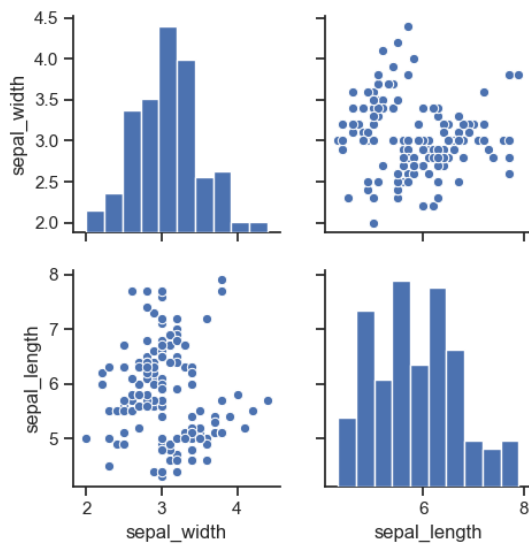
(계속)

```
sns.pairplot(iris, hue="species")  
plt.show()
```



(계속)

```
sns.pairplot(iris, vars=["sepal_width", "sepal_length"])
plt.show()
```



(계속)

```
sns.pairplot(iris, x_vars=["sepal_width", "sepal_length"],
              y_vars=["petal_width", "petal_length"])
plt.show()
```

