

Matplotlib

- 파이썬기초 -

Matplotlib

파이썬의 가장 기본이 되는 데이터 시각화 패키지
이외에 seaborn 이나 plotly 패키지도 있음
차트종류 (<https://matplotlib.org/gallery/index.html>)

<http://matplotlib.org>

소스코드

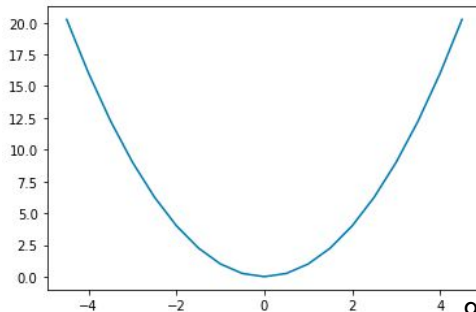
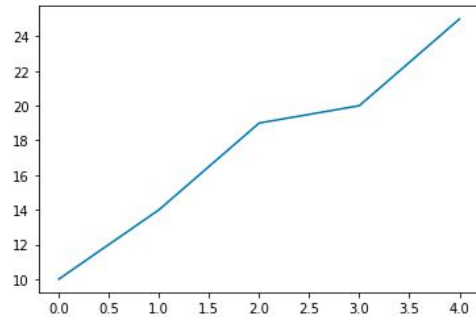
99-1 Matplotlib.ipynb

라인그래프 그리기

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

```
x = [10, 14, 19, 20, 25]  
plt.plot(x)  
plt.show()
```

```
x = np.arange(-4.5, 5, 0.5)  
y = x**2  
plt.plot(x, y)  
plt.show()
```



소스코드

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한번에 여러그래프 그리기

```
x = np.arange(-4.5, 5, 0.5)
```

```
y1 = x**2
```

```
y2 = x+30
```

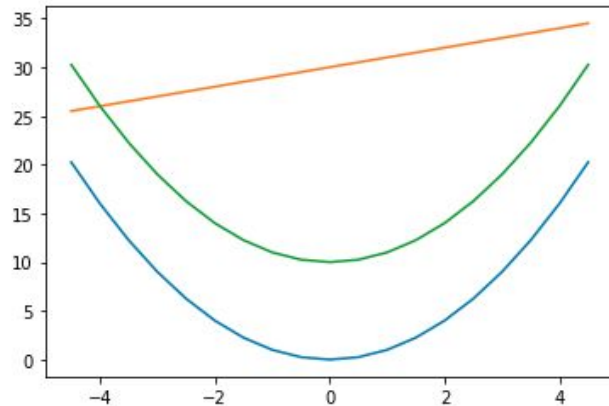
```
y3 = x**2+10
```

```
plt.plot(x, y1)
```

```
plt.plot(x, y2)
```

```
plt.plot(x, y3)
```

```
plt.show()
```



소스코드

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plot 옵션

color - 선의 색조정

color='red' # red, green, blue 등 색의이름
 color='r' # r, g, b, y, m, k 등 색이름 약자
 color='#ff0000' # rgb 색상코드

linestyle - 선의모양

linestyle='solid' # 실선 ('-')
 linestyle='dashed' # 파선 ('--')
 linestyle='dashdot' # 1점 쇄선 ('-.')
 linestyle='dotted' # 점선 (':')

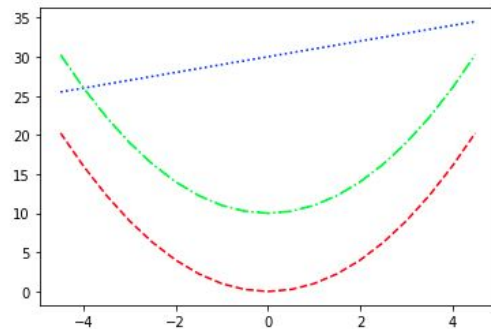
색과 선의모양 동시

plt.plot(x, y, ':r')

```
x = np.arange(-4.5, 5, 0.5)
```

```
y1 = x**2  
y2 = x+30  
y3 = x**2+10
```

```
plt.plot(x, y1, color="red", linestyle="dashed")  
plt.plot(x, y2, "b:")  
plt.plot(x, y3, color='#00FF00', linestyle="-.")  
  
plt.show()
```



https://matplotlib.org/api/_as_gen/matplotlib.pyplot.plot.html#matplotlib.pyplot.plot

소스코드

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축의범위조정

x축

plt.xlim(시작, 끝)

y축

plt.ylim(시작, 끝)

x, y축

plt.axis([x시작, x끝, y시작, y끝])

```
x = np.linspace(0, 10, 100)
```

```
y = x ** 2
```

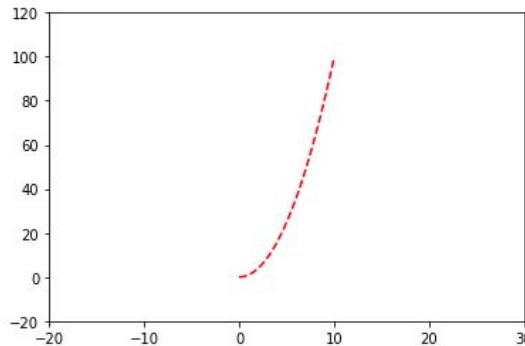
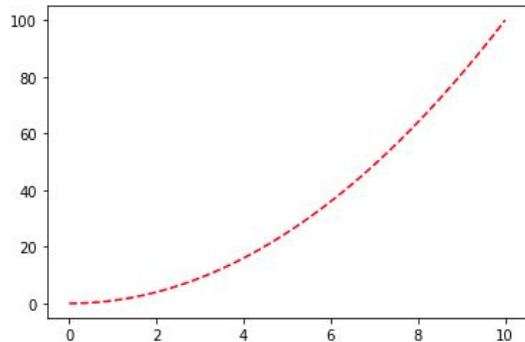
```
plt.plot(x, y, '--r')
```

```
#plt.xlim(-20, 30)
```

```
#plt.ylim(-20, 120)
```

```
plt.axis([-20, 30, -20, 120])
```

```
plt.show()
```



소스코드

99-1 Matplotlib.ipynb

label 과 legend

```
# matplotlib 폰트설정
plt.rc('font', family='AppleGothic') # For MacOS
plt.rc('font', family='Malgun Gothic') # For Windows
```

```
x = np.linspace(0, 10, 100)
```

```
y1 = x ** 2
```

```
y2 = x ** 3
```

선 라벨

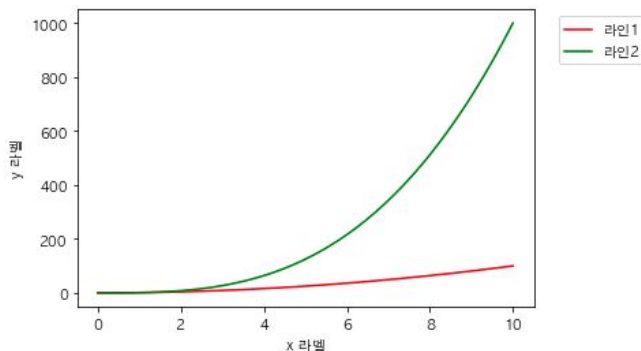
```
plt.plot(x, y1, 'r', label='라인1')
```

```
plt.plot(x, y2, 'g', label='라인2')
```

x축, y 축 라벨

```
plt.xlabel('x 라벨')
```

```
plt.ylabel('y 라벨')
```



```
# plt.legend(loc=2) # 선 라벨표 위치 (그래프내)
```

```
plt.legend(bbox_to_anchor=(1.04, 1)) # 선 라벨표 위치 (그래프밖)
```

```
plt.show()
```

Location String	Location Code
'best'	0
'upper right'	1
'upper left'	2
'lower left'	3
'lower right'	4
'right'	5
'center left'	6
'center right'	7
'lower center'	8
'upper center'	9
'center'	10

https://matplotlib.org/api/_as_gen/matplotlib.pyplot.legend.html#matplotlib.pyplot.legend

<https://stackoverflow.com/questions/4700614/how-to-put-the-legend-out-of-the-plot>

소스코드

99-1 Matplotlib.ipynb

subplot

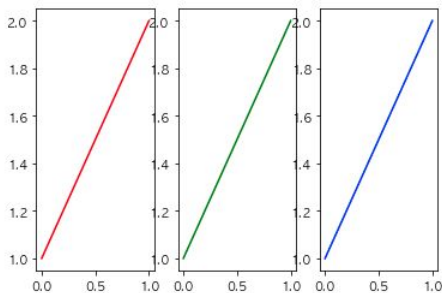
한번에 여러개 차트를 표시, plt.subplot(행열순번)

```
plt.subplot(131)
plt.plot([1, 2], color='r')

plt.subplot(132)
plt.plot([1, 2], color='g')

plt.subplot(133)
plt.plot([1, 2], color='b')

plt.show()
```

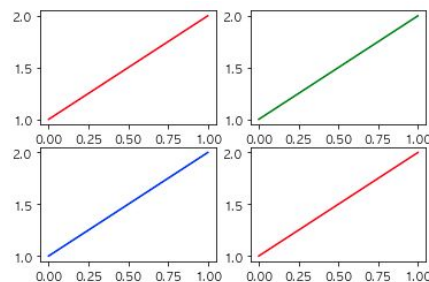


```
plt.subplot(221)
plt.plot([1, 2], color='r')

plt.subplot(222)
plt.plot([1, 2], color='g')

plt.subplot(223)
plt.plot([1, 2], color='b')

plt.subplot(224)
plt.plot([1, 2], color='r')
```



```
plt.show()
```

소스코드

99-1 Matplotlib.ipynb

subplot & grid

```
plt.figure(figsize=(5, 5)) # 그래프 전체 크기
grid = plt.GridSpec(2, 3) # GridSpec(행, 열)
```

```
plt.subplot(grid[0, 0])
plt.plot([1, 2], color='r')
```

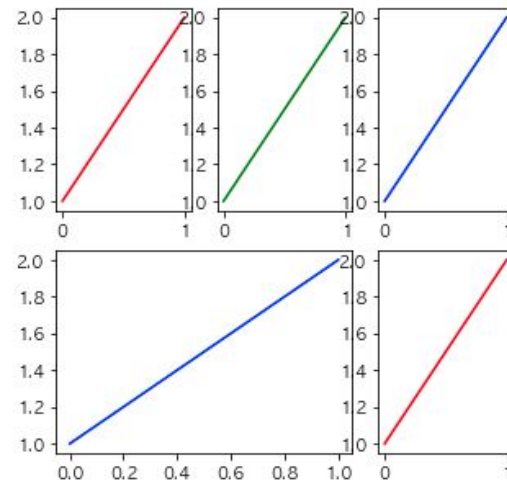
```
plt.subplot(grid[0, 1])
plt.plot([1, 2], color='g')
```

```
plt.subplot(grid[0, 2])
plt.plot([1, 2], color='b')
```

```
plt.subplot(grid[1, :2])
plt.plot([1, 2], color='b')
```

```
plt.subplot(grid[1, 2])
plt.plot([1, 2], color='r')
```

```
plt.show()
```



소스코드

99-1 Matplotlib.ipynb

Scatter (산점도)

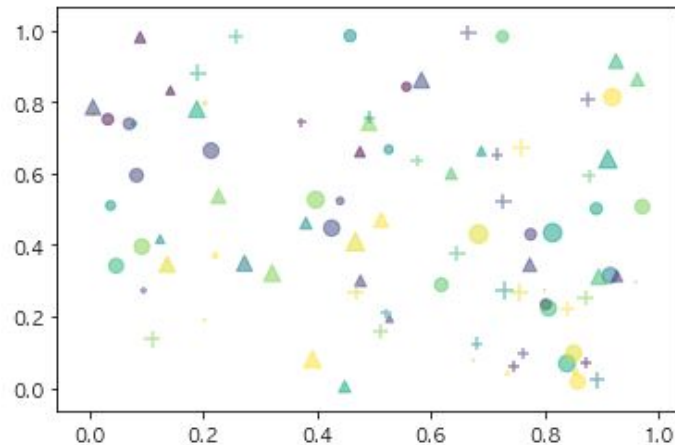
```
import matplotlib.pyplot as plt
import numpy as np
```

```
x = np.random.rand(30)
y = np.random.rand(30)
a = np.random.rand(30)
b = np.random.rand(30)
e = np.random.rand(30)
f = np.random.rand(30)
color = np.random.rand(30)
```

```
size = 100 * np.random.rand(30)
```

```
plt.scatter(x, y, s=size, c=color, alpha=0.5, marker='o')
plt.scatter(a, b, s=size, c=color, alpha=0.5, marker='^')
plt.scatter(e, f, s=size, c=color, alpha=0.5, marker='+')
plt.show()
```

c - 색상
s - 사이즈
alpha - 투명도
marker - 모양

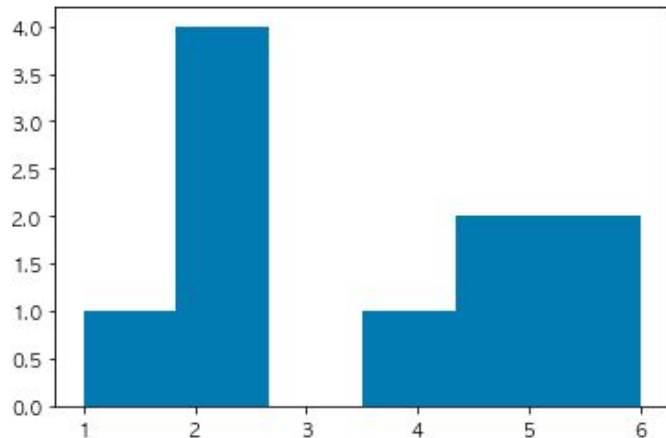


https://matplotlib.org/api/_as_gen/matplotlib.pyplot.scatter.html#matplotlib.pyplot.scatter

Histogram (히스토그램)

bins - 너비

```
data = [np.random.randint(1, 7) for i in range(10)]  
plt.hist(data, bins=6, alpha=1)  
plt.show()
```



<https://matplotlib.org/gallery/statistics/hist.html#sphx-glr-gallery-statistics-hist-py>

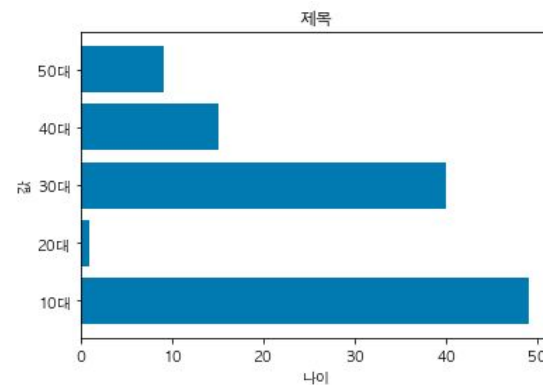
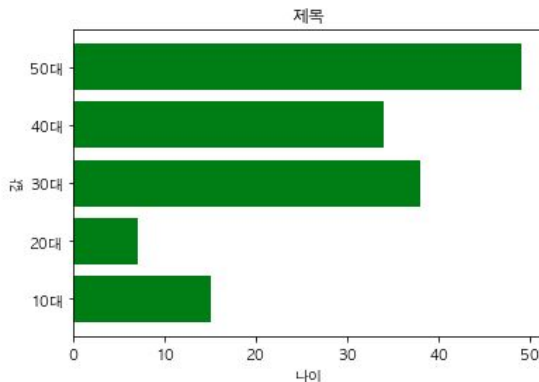
Bar (바차트)

```
plt.bar(['10대', '20대', '30대', '40대', '50대'], [np.random.randint(1, 50) for i in range(5)])
```

세로그래프

```
plt.barh(['10대', '20대', '30대', '40대', '50대'], [np.random.randint(1, 50) for i in range(5)], color='g')
```

```
plt.title('제목')
plt.xlabel('나이')
plt.ylabel('값')
plt.show()
```



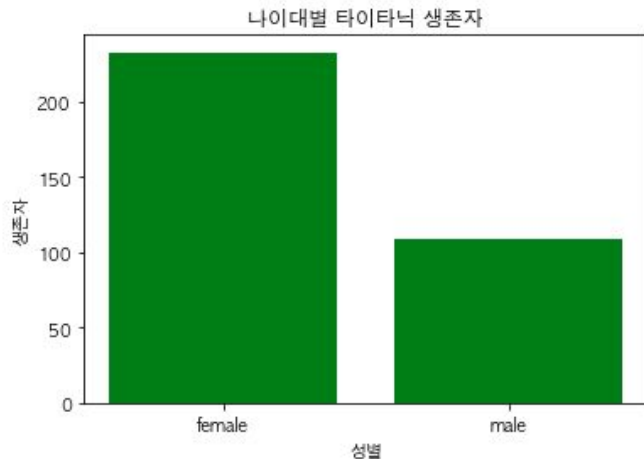
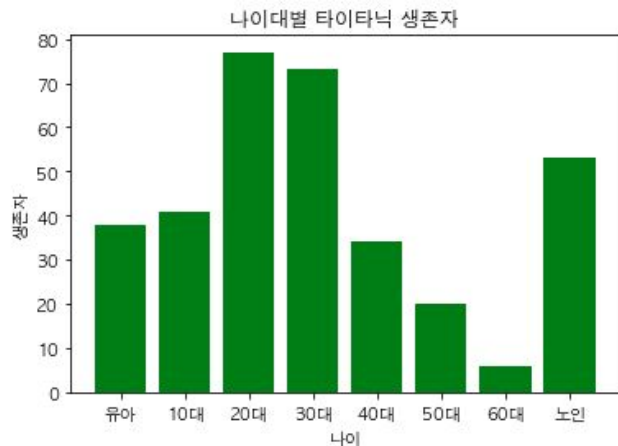
소스코드

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https://matplotlib.org/api/_as_gen/matplotlib.axes.Axes.barh.html#matplotlib.axes.Axes.barh

실습1 (타이타닉 생존자체크)

판다스에서 했던 결과를 가지고 아래와같은 바그래프를 그리세요.

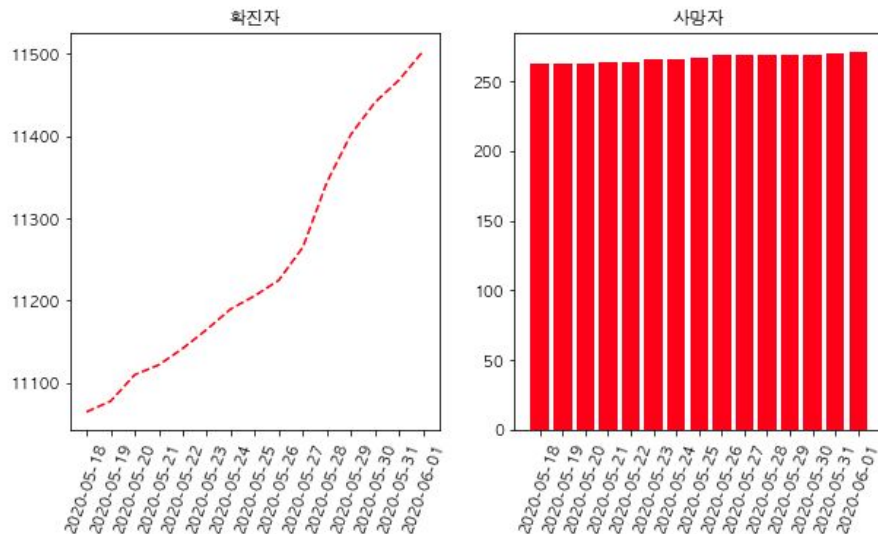


소스코드

99-1 Matplotlib.ipynb

실습2 (코로나데이터)

kr_daily.csv 파일을 읽어 아래와같은 그래프 두개를 한화면에 그리세요.



소스코드

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