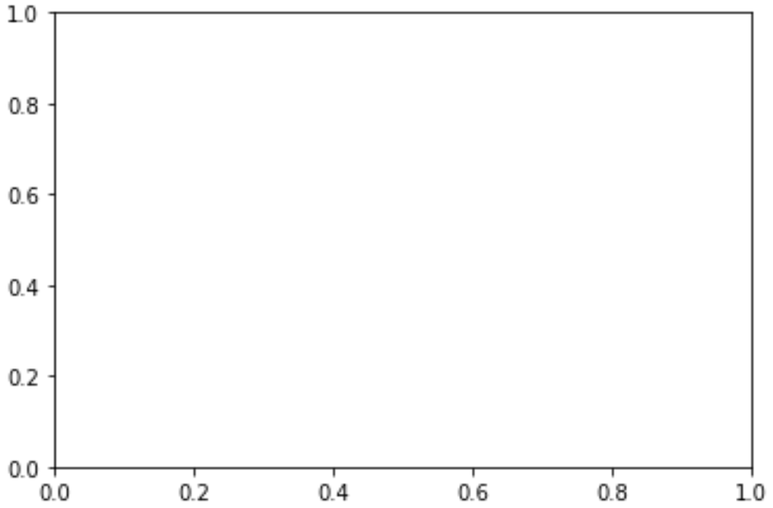
Chapter 1
Introduction to Matplotlib

Introduction to data visualization with matplotlib

Part 1 .
Introduction to
data visualization with matplotlib

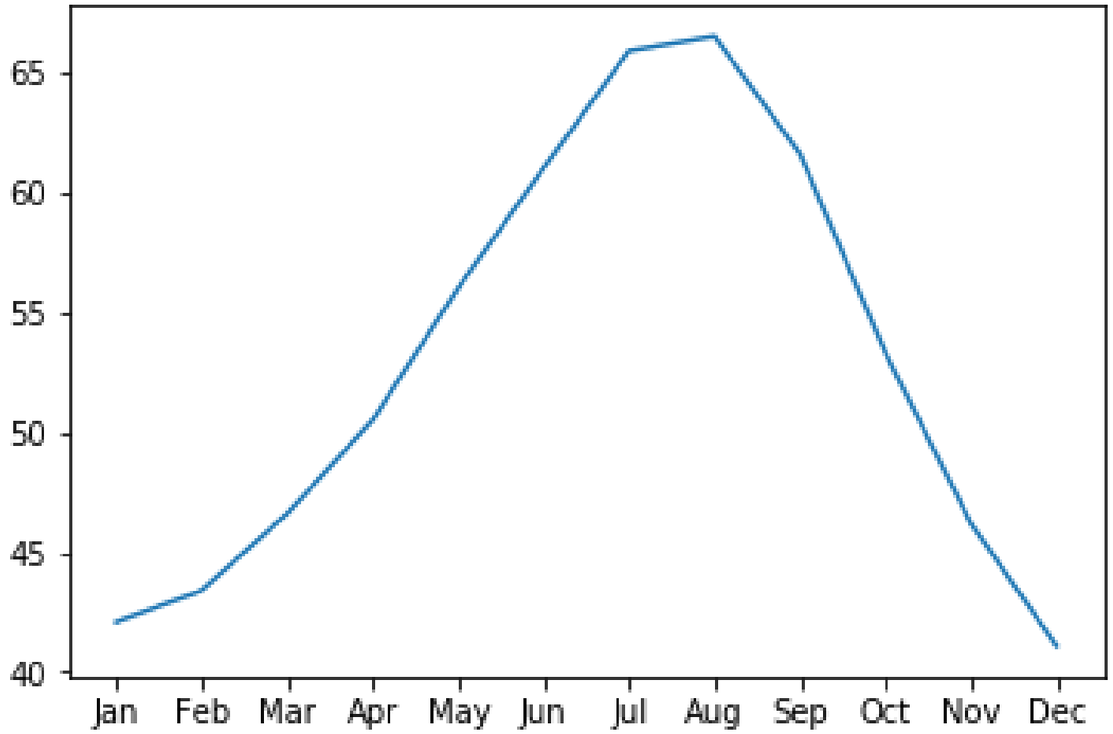
Introducing the pyplot interface

```
import matplotlib.pyplot as plt
fig, ax = plt.subplots()   # fig : 변수, ax : 축에 대한 정보
plt.show()                 # plot 그리는 코드
```



Adding data to axes

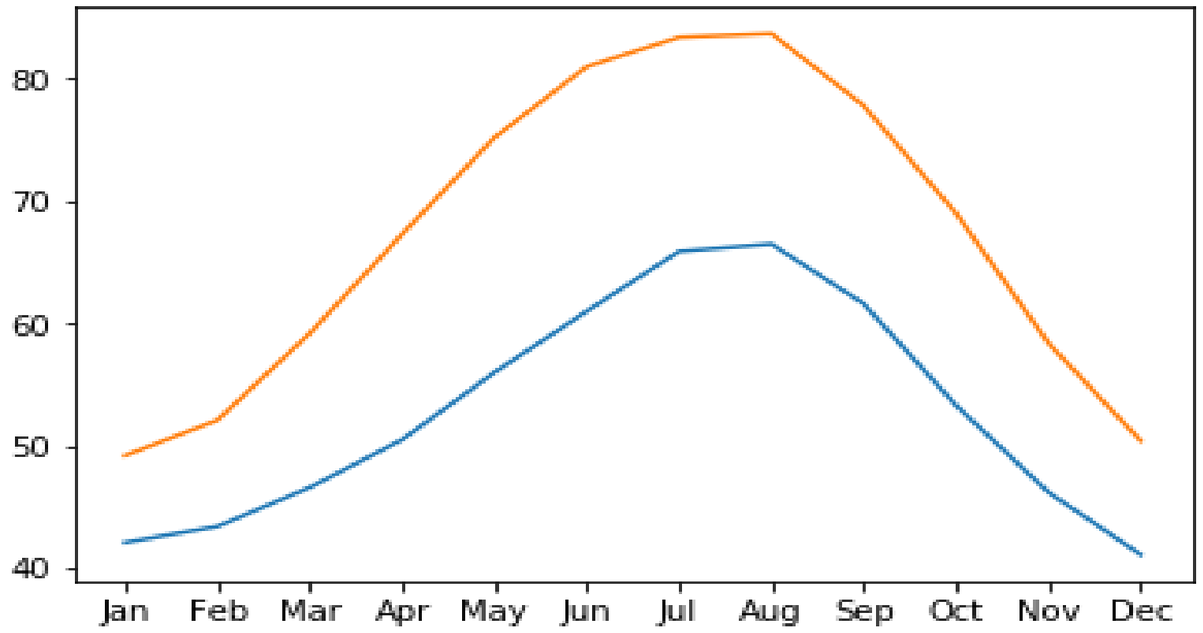
```
ax.plot(seattle_weather["MONTH"], seattle_weather["MLY-TAVG-NORMAL"]    # ax.plot(x축 변수, y축 변수)
plt.show()
```



Adding new plot + Putting it all together

```
fig, ax = plt.subplots()
ax.plot(seattle_weather["MONTH"], seattle_weather["MLY-TAVG-NORMAL"])
ax.plot(austin_weather["MONTH"], austin_weather["MLY-TAVG-NORMAL"])
plt.show()
```

ax.plot(x축 변수, y축 변수), 기존 plot에 덧붙여서 새로운 변수의 그래프 생성

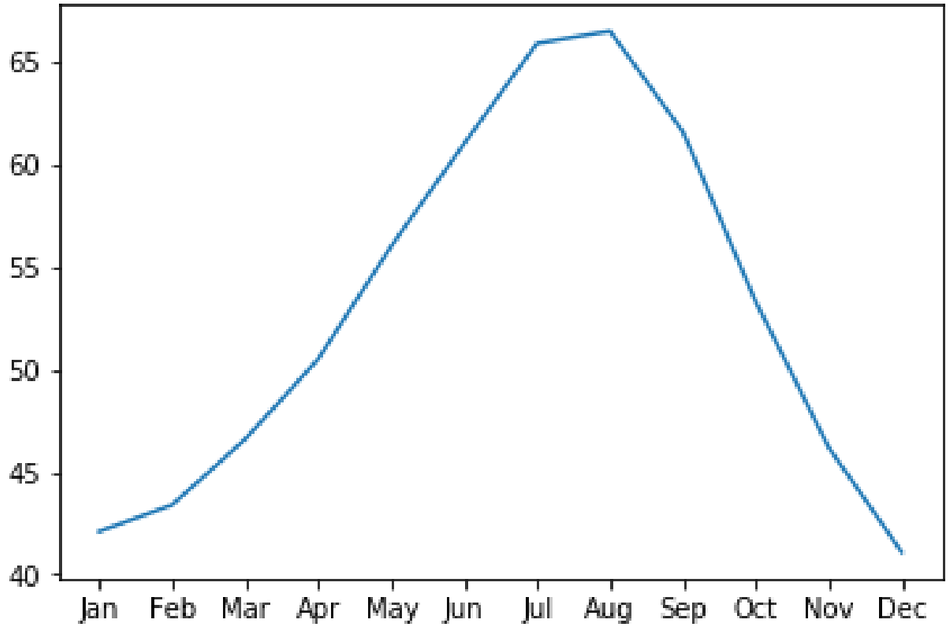


Part 2 .
Customizing your plots

Customizing data appearance

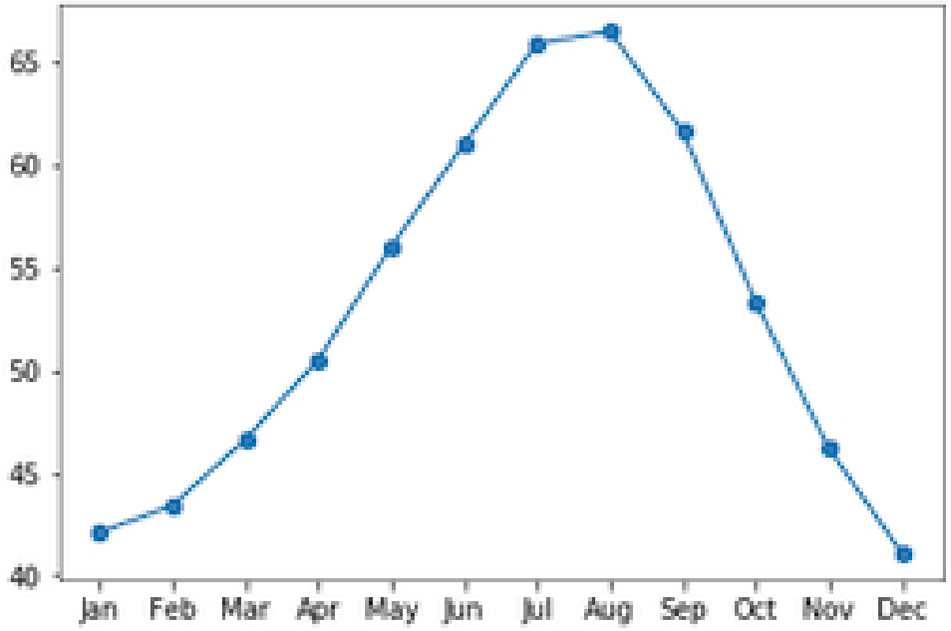
```
ax.plot(seattle_weather["MONTH"],  seattle_weather["MLY-PRCP-NORMAL"])
plt.show()
```

ax.plot(x variable, y variable)외의 다른 옵션은 지정하지 않은 default 상태



Adding markers

```
ax.plot(seattle_weather["MONTH"],  seattle_weather["MLY-PRCP-NORMAL"],
                marker="o")     #marker="v","o", 등등이 있음, data point를 모양으로 나타내는 옵션
plt.show()
```

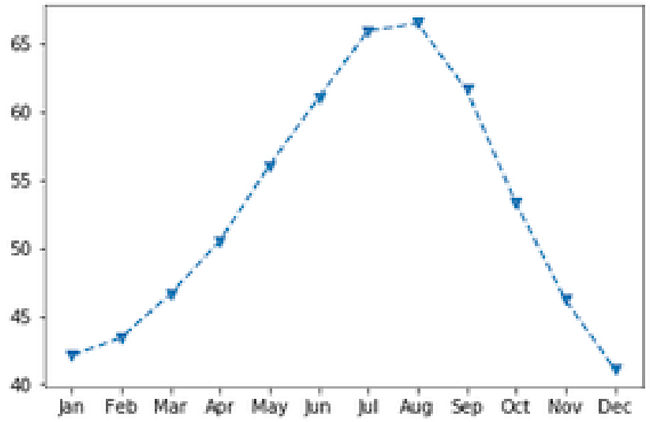


참조, 더 많은 marker option

h ps://matplotlib.org/api/markers_api.html

Setting the linestyle

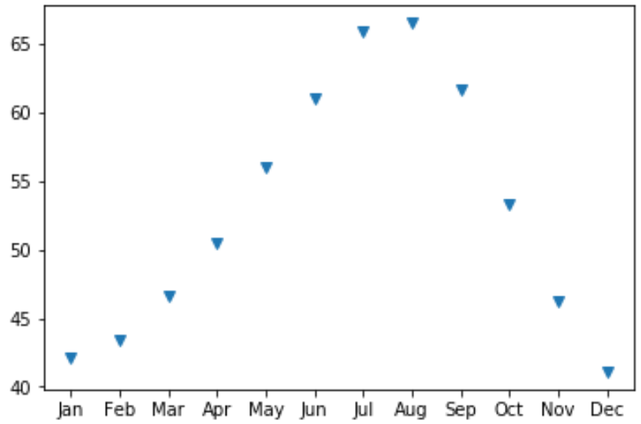
```
fig, ax = plt.subplots()  ax.plot(seattle_weather["MONTH"],
                seattle_weather["MLY-TAVG-NORMAL"],  marker="v", linestyle="--")      # linestyle을 지정하는 옵션
plt.show()
```



https://matplotlib.org/gallery/lines_bars_and_markers/line_styles_reference.html

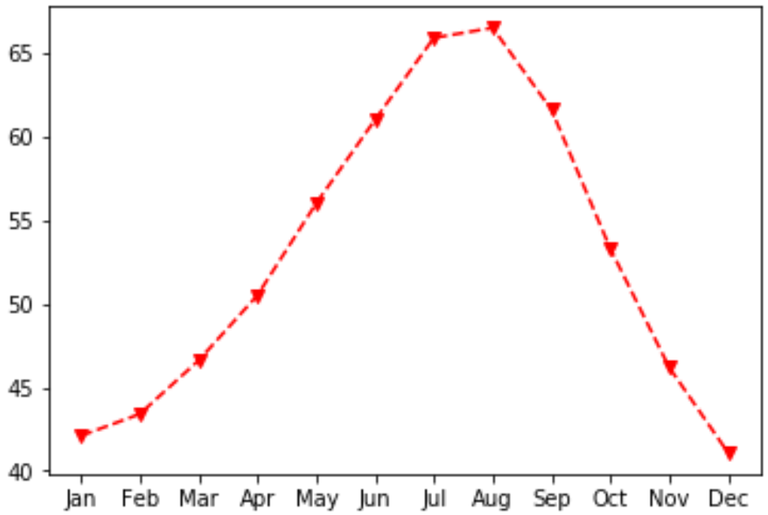
Eliminating lines with linestyle

```
fig, ax = plt.subplots()  ax.plot(seattle_weather["MONTH"],
                  seattle_weather["MLY-TAVG-NORMAL"],  marker="v", linestyle="None")       # line을 제거하는 옵션
plt.show()
```



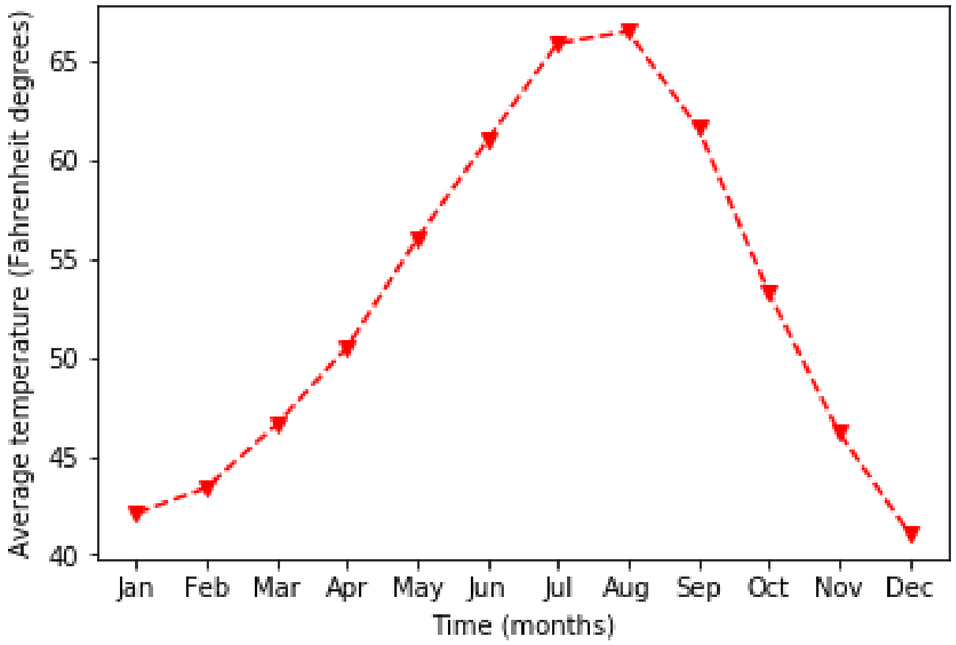
Choosing color

```
fig, ax = plt.subplots()  ax.plot(seattle_weather["MONTH"],
                seattle_weather["MLY-TAVG-NORMAL"],  marker="v", linestyle="--",
                color="r")  # line color를 지정하는 옵션
plt.show()
```



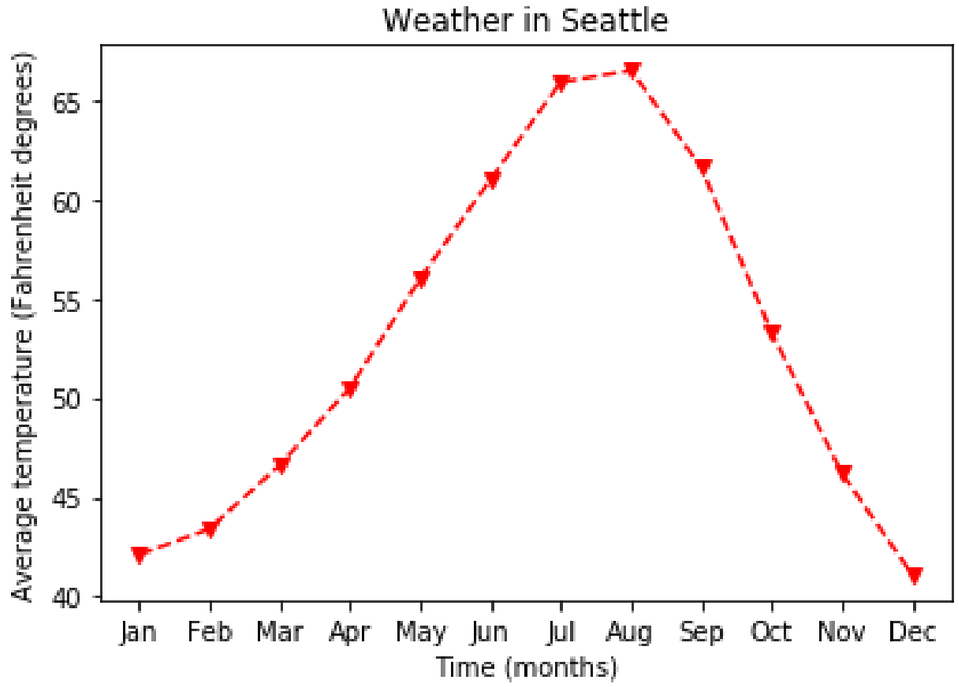
Setting the axes & yaxis label

```
ax.set_xlabel("Time (months)")      # xlabel을 지정하는 옵션
ax.set_ylabel("Average temperature (Fahrenheit degrees)")      #ylabel을 지정하는 옵션
plt.show()
```



Adding a title

```
ax.set_title("Weather in Seattle") # title을 지정하는 옵션
plt.show()
```

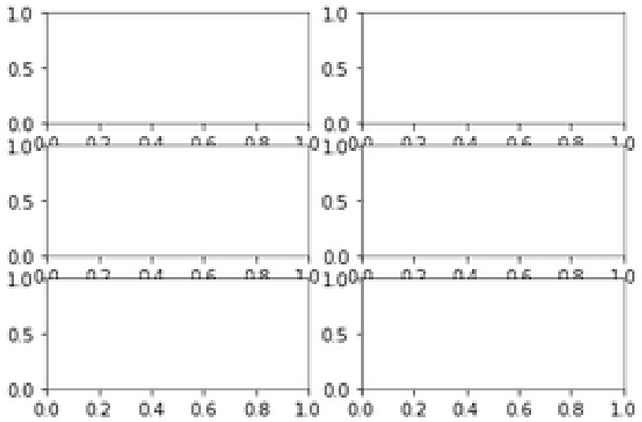


Part 3 .
Small multiples

Small multiples with plt.subplots

```
fig, ax = plt.subplots()
```

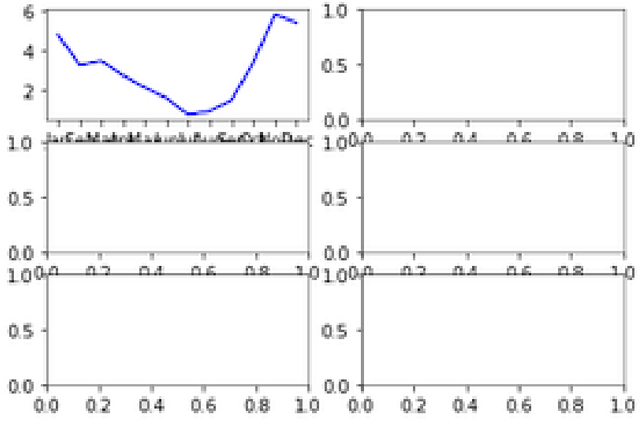
```
fig, ax = plt.subplots(3,2)          #plt.subplots(row의 개수, col의 개수) : row * col 의 subplots들이 생성됨

plt.show()
```



Adding data to subplots

```
ax.shape  (3, 2)
```

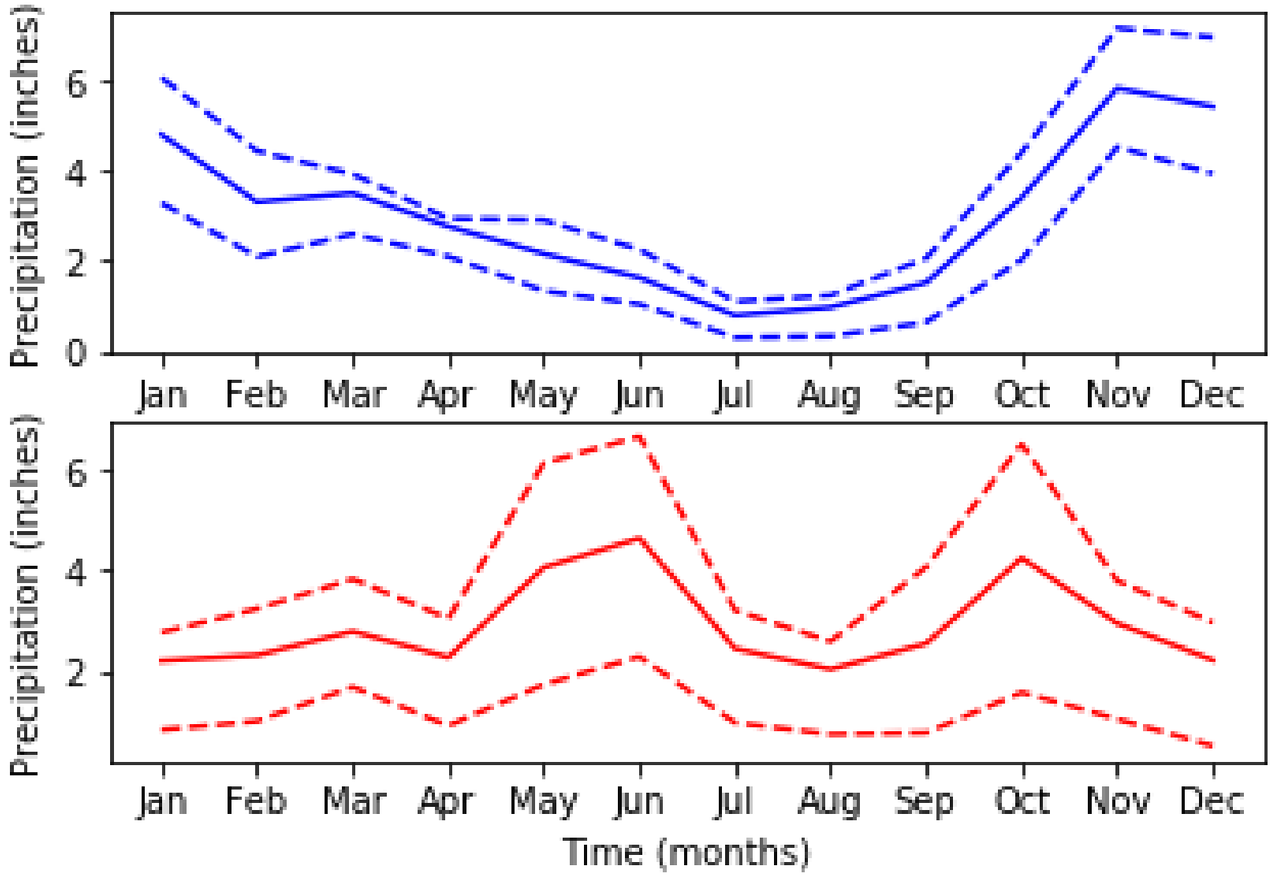
```
ax[0, 0].plot(seattle_weather["MONTH"],    # subplot의 위치 index [a,b] 지정
              seattle_weather["MLY-PRCP-NORMAL"],  color='b')
plt.show()
```



Subplots with data

```
fig, ax = plt.subplots(2, 1)
ax[0].plot(seattle_weather["MONTH"], seattle_weather["MLY-PRCP-NORMAL"],  color='b')
ax[0].plot(seattle_weather["MONTH"], seattle_weather["MLY-PRCP-25PCTL"],  linestyle='--', color='b')
ax[0].plot(seattle_weather["MONTH"], seattle_weather["MLY-PRCP-75PCTL"],  linestyle='--', color='b')
ax[1].plot(austin_weather["MONTH"], austin_weather["MLY-PRCP-NORMAL"],  color='r')
ax[1].plot(austin_weather["MONTH"], austin_weather["MLY-PRCP-25PCTL"],  linestyle='--', color='r')
ax[1].plot(austin_weather["MONTH"], austin_weather["MLY-PRCP-75PCTL"],  linestyle='--', color='r')
ax[0].set_ylabel("Precipitation (inches)")
ax[1].set_ylabel("Precipitation  (inches)")
ax[1].set_xlabel("Time (months)") # 동일한 종류의 x축을 공유하므로, 한번만 지정
plt.show()
```

Subplots with data



Sharing the y-axis range

```
fig, ax = plt.subplots(2, 1,sharey=True)   # sharey =TRUE, y축의 range를 동일하게 하는 option , 두 그래프를 비교하기에 용이해짐
```