Link github: https://github.com/NguyenHuynhThaoNhu/MKTG5883.N22_19521970

I. Matplotlib

1. Importing

Entrée [1]:
```
import matplotlib.pyplot as plt
```

Entrée [2]:
```
%matplotlib inline
```

2. Basic example

Entrée [3]:
```
import numpy as np
x=np.linspace(0,5,11)
y=x**2
```

Entrée [4]:
```
x
```

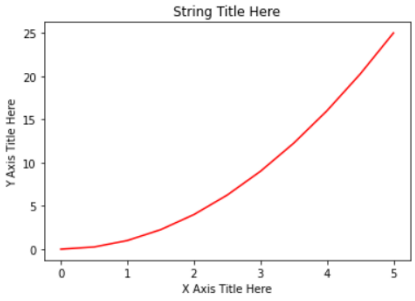
Out[4]:
```
array([0. , 0.5, 1. , 1.5, 2. , 2.5, 3. , 3.5, 4. , 4.5, 5. ])
```

Entrée [5]:
```
y
```

Out[5]:
```
array([ 0.  ,  0.25,  1.  ,  2.25,  4.  ,  6.25,  9.  , 12.25, 16.  ,
       20.25, 25.  ])
```

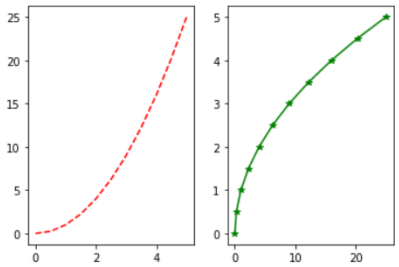
3. Basic Matplotlib Commands

Entrée [6]:
```
plt.plot(x,y,'r')
plt.xlabel('X Axis Title Here')
plt.ylabel('Y Axis Title Here')
plt.title('String Title Here')
plt.show()
```



4. Creating Multiplots on Same Canvas

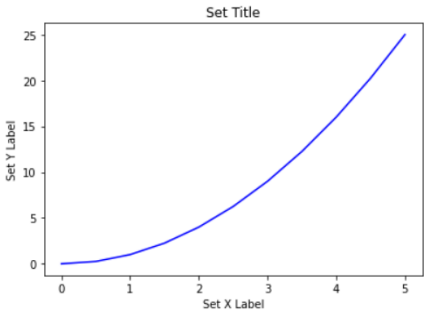
Entrée [7]:
```
plt.subplot(1,2,1)
plt.plot(x,y,'r--')
plt.subplot(1,2,2)
plt.plot(y,x,'g*-');
```



5. Object Oriented Method

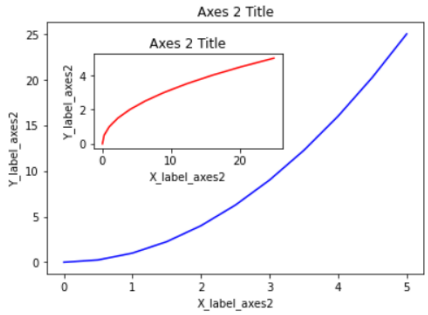
Entrée [8]:
```
fig=plt.figure()
axes=fig.add_axes([0.1,0.1,0.8,0.8])
axes.plot(x,y,'b')
axes.set_xlabel('Set X Label')
axes.set_ylabel('Set Y Label')
axes.set_title('Set Title')
```

Out[8]:
```
Text(0.5, 1.0, 'Set Title')
```



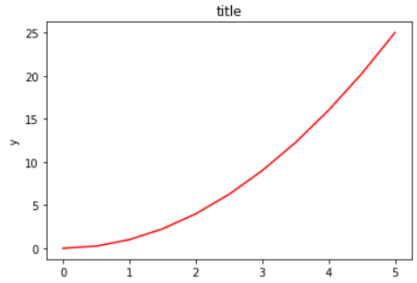
Entrée [10]:
```
fig=plt.figure()
axes1=fig.add_axes([0.1,0.1,0.8,0.8])
axes2=fig.add_axes([0.2,0.5,0.4,0.3])
axes1.plot(x,y,'b')
axes1.set_xlabel('X_label_axes2')
axes1.set_ylabel('Y_label_axes2')
axes1.set_title('Axes 2 Title')
axes2.plot(y,x,'r')
axes2.set_xlabel('X_label_axes2')
axes2.set_ylabel('Y_label_axes2')
axes2.set_title('Axes 2 Title')
```

Out[10]:
```
Text(0.5, 1.0, 'Axes 2 Title')
```

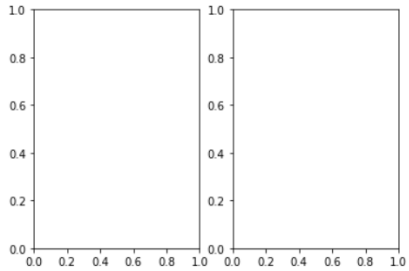


6. Suplot()

Entrée [11]:
```
fig,axes=plt.subplots()
axes.plot(x,y,'r')
axes.set_xlabel('x')
axes.set_ylabel('y')
axes.set_title('title');
```



Entrée [13]:
```
fig,axes=plt.subplots(nrows=1,ncols=2)
```

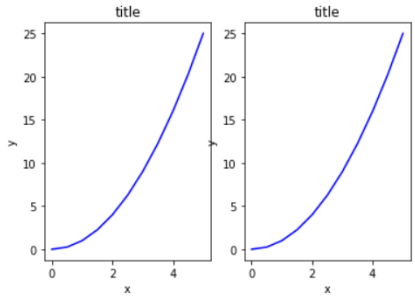


Entrée [14]:
```
axes
```

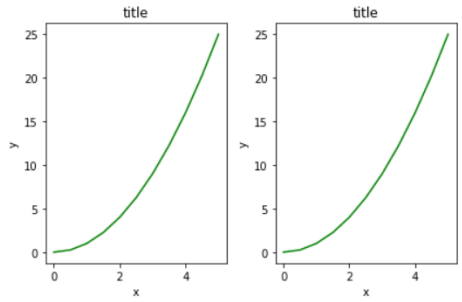
Out[14]:
```
array([<AxesSubplot:>, <AxesSubplot:>], dtype=object)
```

Entrée [15]:
```
for ax in axes:
    ax.plot(x,y,'b')
    ax.set_xlabel('x')
    ax.set_ylabel('y')
    ax.set_title('title')
fig
```

Out[15]:



Entrée [16]:
```
fig,axes=plt.subplots(nrows=1,ncols=2)
for ax in axes:
    ax.plot(x,y,'g')
    ax.set_xlabel('x')
    ax.set_ylabel('y')
    ax.set_title('title')
fig
plt.tight_layout()
```

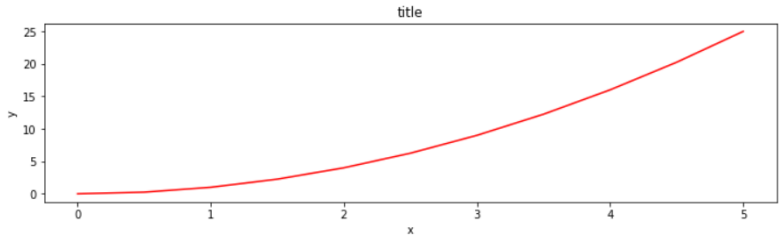


7. Figure size, aspect ratio and DPI

Entrée [18]:
```
fig=plt.figure(figsize=(8,4),dpi=100)
```

```
<Figure size 800x400 with 0 Axes>
```

Entrée [19]:
```
fig,axes=plt.subplots(figsize=(12,3))
axes.plot(x,y,'r')
axes.set_xlabel('x')
axes.set_ylabel('y')
axes.set_title('title');
```



8. Saving figures

Entrée [20]:
```
fig.savefig("filename.png")
```

Entrée [21]:
```
fig.savefig("filename.png",dpi=200)
```

9. Figure titles

Entrée [22]:
```
ax.set_title("title")
```

Out[22]:
```
Text(0.5, 1.0, 'title')
```

10. Axis labels

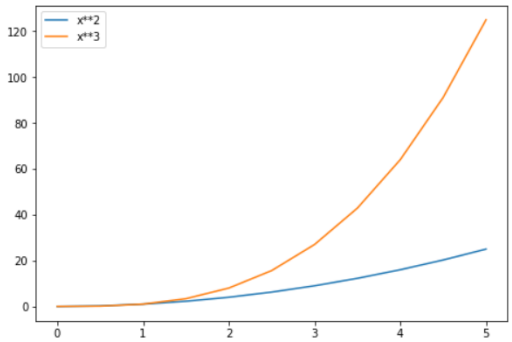
Entrée [23]:
```
ax.set_xlabel("x")
ax.set_ylabel("y")
```

Out[23]:
```
Text(227.80000000000004, 0.5, 'y')
```

11. Legends

Entrée [25]:
```
fig=plt.figure()
ax=fig.add_axes([0,0,1,1])
ax.plot(x,x**2,label="x**2")
ax.plot(x,x**3,label="x**3")
ax.legend()
```

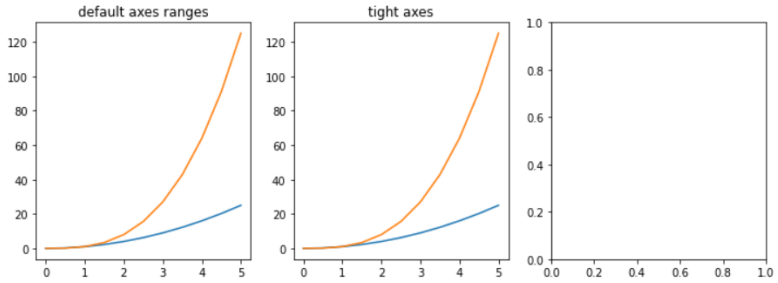
Out[25]:
```
<matplotlib.legend.Legend at 0x1c0d49e1fa0>
```



12. Plot range

Entrée [26]:
```
fig,axes=plt.subplots(1,3,figsize=(12,4))
axes[0].plot(x,x**2,x,x**3)
axes[0].set_title("default axes ranges")
axes[1].plot(x,x**2,x,x**3)
axes[1].axis('tight')
axes[1].set_title("tight axes")
```

Out[26]:
```
Text(0.5, 1.0, 'tight axes')
```



II. Seaborn

1. Load testing dataset

Entrée [28]:
```
import pandas as pd
import matplotlib.pyplot as plt
import matplotlib.image as mpimg
import seaborn as sns
%matplotlib inline
sns.get_dataset_names()
```

Out[28]:
```
['anagrams',
 'anscombe',
 'attention',
 'brain_networks',
 'car_crashes',
 'diamonds',
 'dots',
 'exercise',
 'flights',
 'fmri',
 'gammas',
 'geyser',
 'iris',
 'mpg',
 'penguins',
 'planets',
 'taxis',
 'tips',
 'titanic']
```

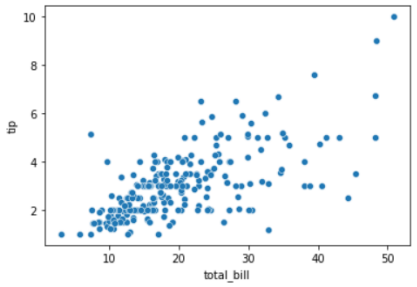
Entrée [29]:
```
tips=sns.load_dataset("tips")
tips.head()
```

Out[29]:

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4

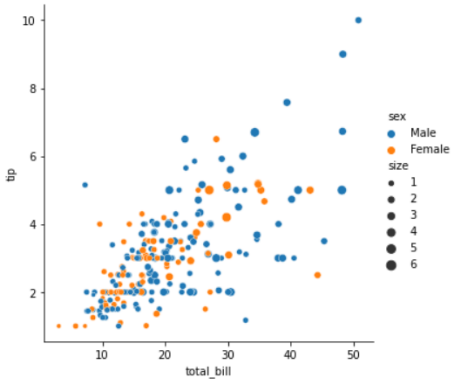
2. Scatter plot

Entrée [30]:
```
ax=sns.scatterplot(x="total_bill",y="tip",data=tips)
```



Entrée [32]:
```
sns.relplot(x="total_bill",y="tip",data=tips,kind="scatter",hue="sex",size="size",)
```

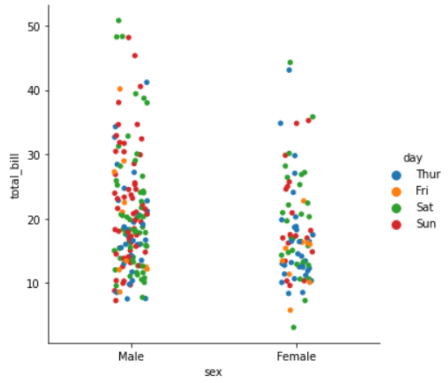
Out[32]:
```
<seaborn.axisgrid.FacetGrid at 0x1c0d4a1ea00>
```



3. Categorical functions

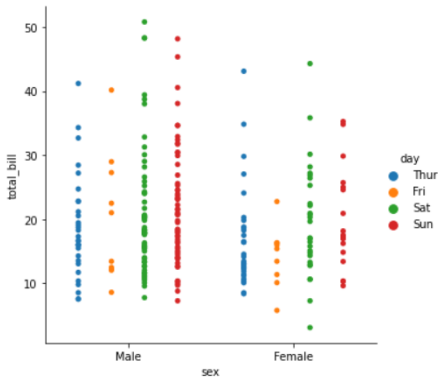
Entrée [33]:
```
sns.catplot(x="sex",y="total_bill",hue="day",data=tips,kind="strip")
```

Out[33]:
```
<seaborn.axisgrid.FacetGrid at 0x1c0d73c9af0>
```



Entrée [34]:
```
sns.catplot(x="sex",y="total_bill",hue="day",data=tips,kind="strip",jitter=False,dodge=True)
```

Out[34]: <seaborn.axisgrid.FacetGrid at 0x1c0d74ed760>



Entrée [35]:
```
sns.catplot(x="sex",y="total_bill",hue="day",data=tips,kind="box")
```

Out[35]: <seaborn.axisgrid.FacetGrid at 0x1c0d853af10>