視覺化套件

Bokeh & folium

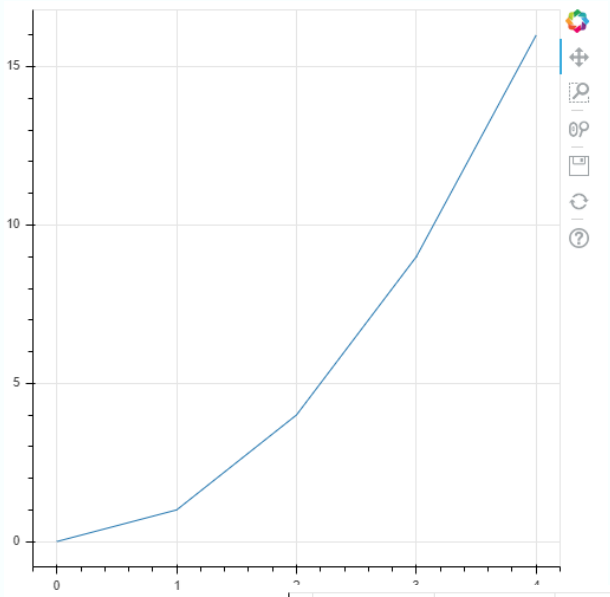
Bokeh

Bokeh介紹

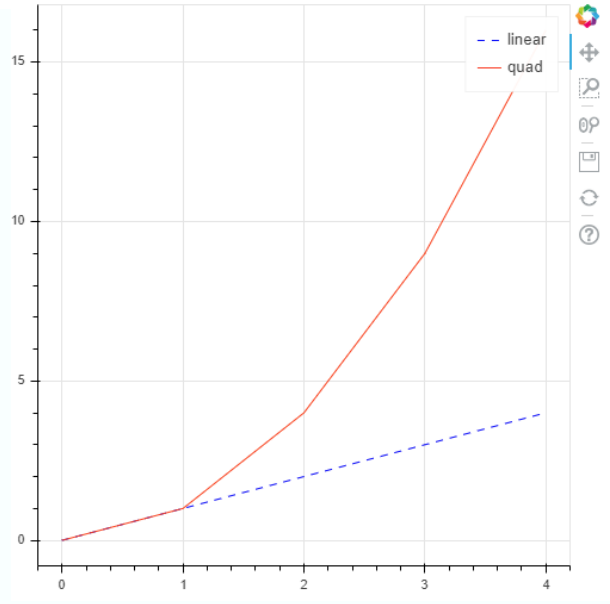
- 在資料視覺化方面，matplotlib、Seaborn套件幾乎可以滿足大多的繪圖條件，但這些套件只能做出靜態圖表，若想要讓使用者和圖表能直接互動，那就要使用bokeh套件
- 使用bokeh製作出來的圖表，可以使用滑鼠拖曳或縮放

折線圖

```python
from bokeh.plotting import figure, show

# 設定資料
x = [0, 1, 2, 3, 4]
y = [0, 1, 4, 9, 16]

# 設定繪圖板寬高
p = figure(plot_width=500, plot_height=500)

# 繪製折線圖
p.line(x, y)
show(p)
```

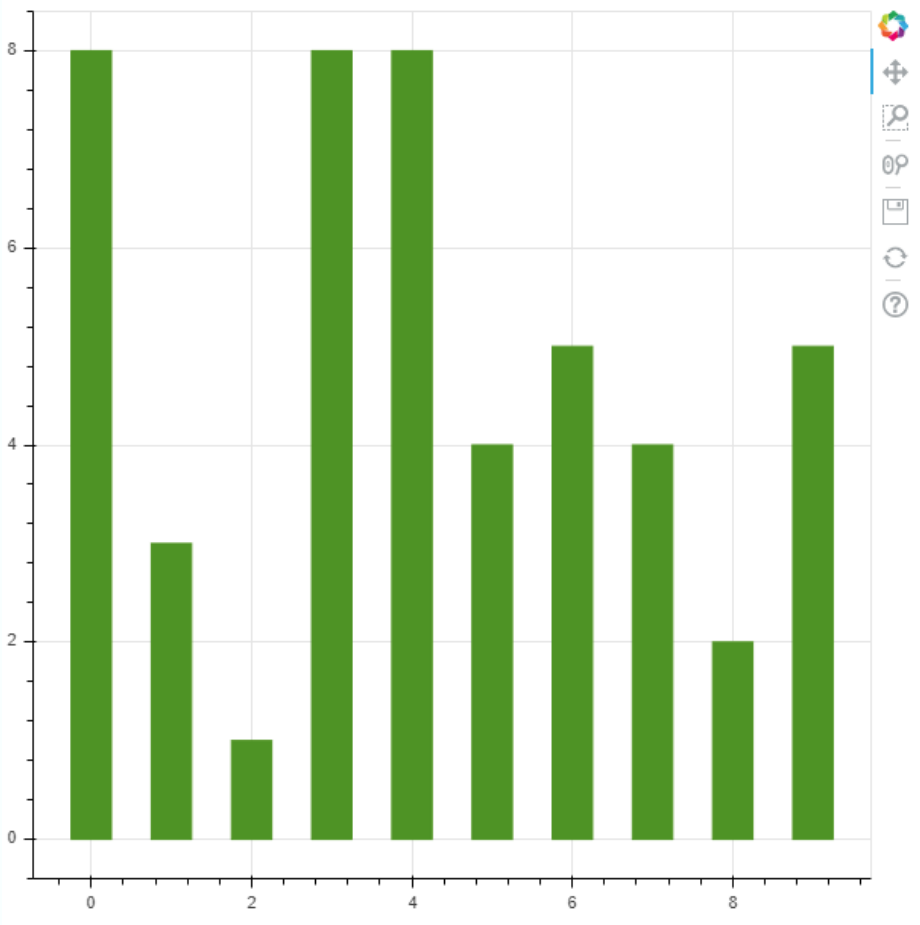



```python
from bokeh.plotting import figure, show

# 設定資料
x = [0, 1, 2, 3, 4]
y = [0, 1, 4, 9, 16]

# 設定繪圖板寬高
p = figure(plot_width=500, plot_height=500)

# 繪製折線圖
p.line(x, x, line_color='blue', legend_label='linear', line_dash='dashed')
p.line(x, y, line_color='#FF4310', legend_label='quad', line_dash='solid')

show(p)
```



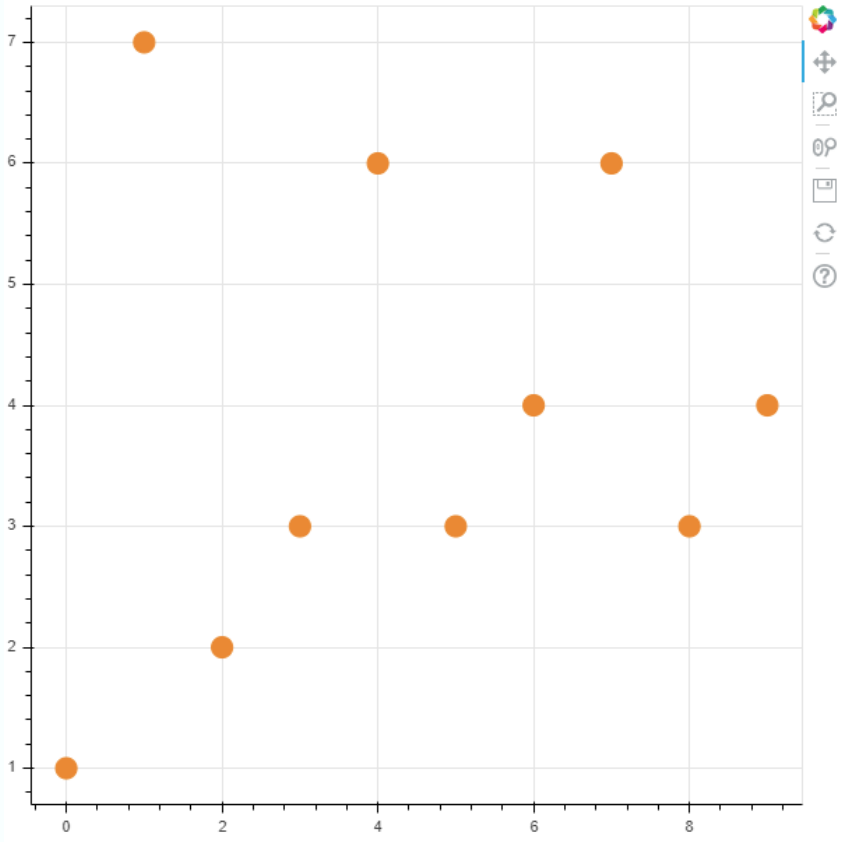
長條圖

```python
from bokeh.plotting import figure, show
import numpy as np

# 設定資料
x = np.arange(10)
y = np.random.randint(1,11,10)

# 設定畫布
p = figure()

# 繪製長條圖
p.vbar(x, top=y, width=0.5, bottom=0, color="#499312")

show(p)
```



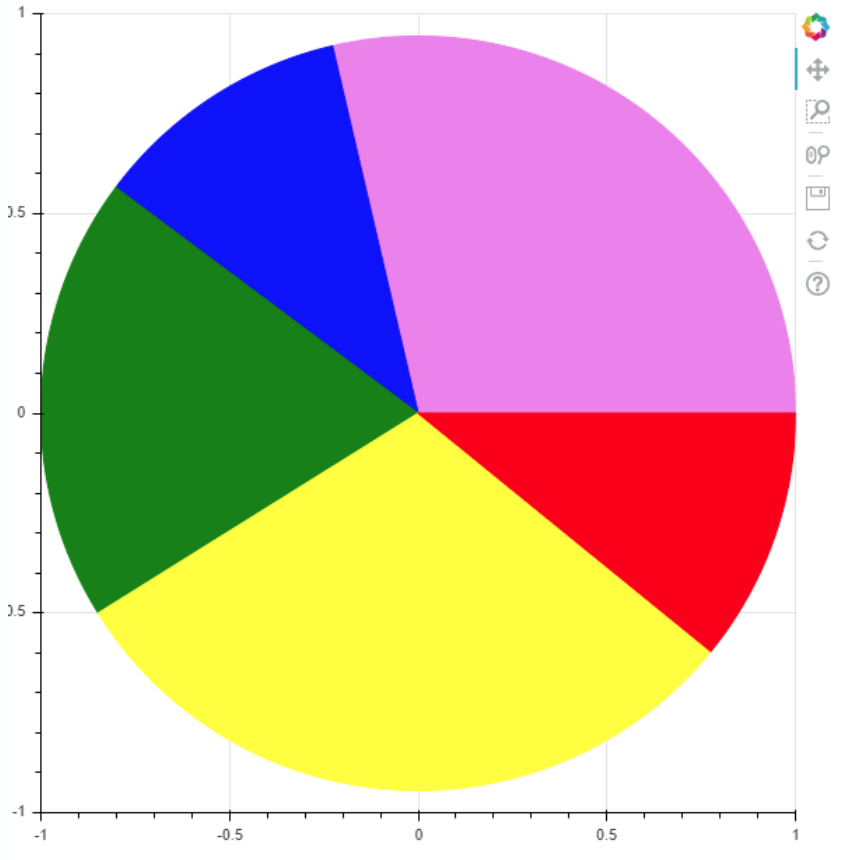
散點圖

```python
from bokeh.plotting import figure, show
import numpy as np

# 設定資料
x = np.arange(10)
y = np.random.randint(1,10,10)

# 設定繪圖
p = figure()

# 繪製散點圖(散點大小15)
p.circle(x, y, size=15, color="#ED8B21")

show(p)
```



圖餅圖

```python
from bokeh.plotting import figure, show

# 設定資料
x = 0
y = 0
radius = 1

start_angle = [0, 1.8, 2.5,3.7, 5.6]
end_angle = [1.8, 2.5, 3.7,5.6, 0]
color = ["violet", "blue", "green","yellow", "red"]

p = figure()

p.wedge(x, y, radius,start_angle,end_angle,color=color)

show(p)
```



儲存檔案

- 若想將bokeh產生的圖存檔，可以使用 save()功能
- 使用前需要先匯入save、output_file

```
from bokeh.plotting import figure, show, save, output_file
import numpy as np

# 設定資料
x = np.arange(10)
y = np.random.randint(1,10,10)

# 設定繪圖
p = figure()

# 繪製散點圖(散點大小15)
p.circle(x, y, size=15, color="#00ff00")

# 設定檔名
output_file("output.html")

# 儲存檔案
save(p)
show(p)
```

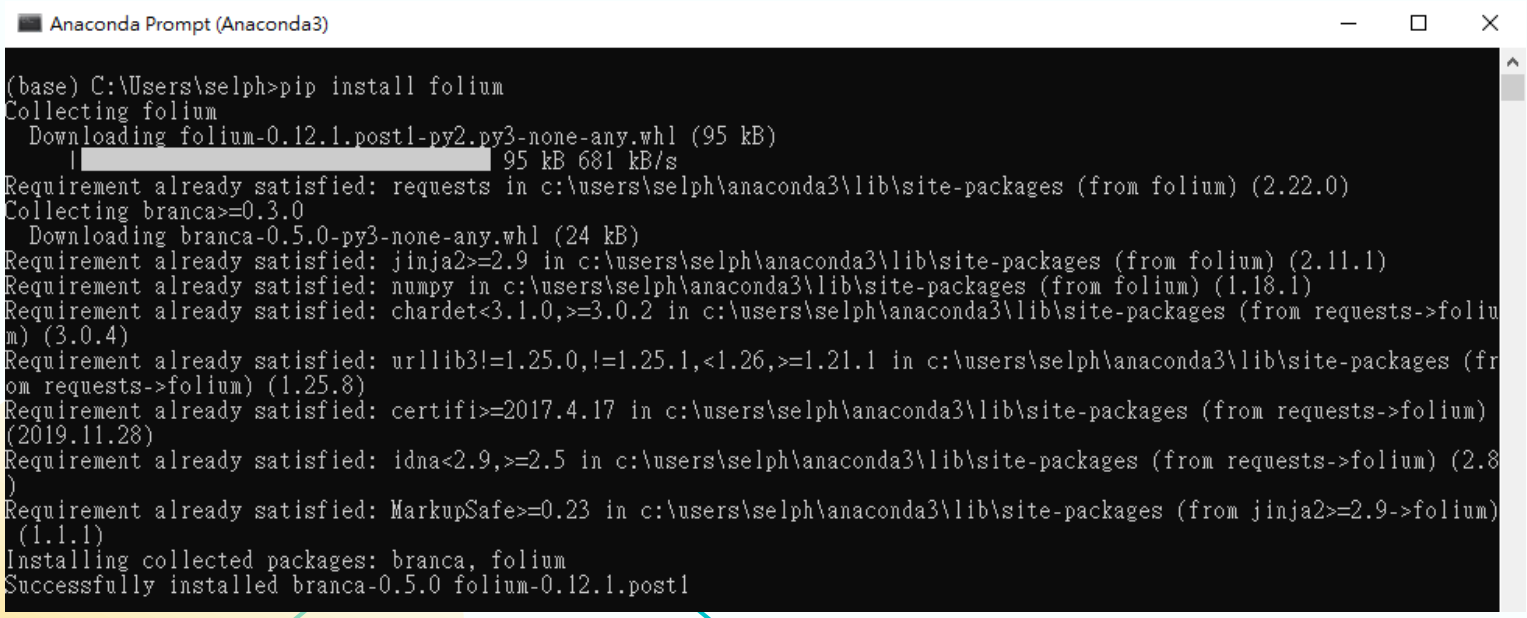
folium

安裝folium套件

- folium是基於Leaflet的JavaScript Library的Python地圖視覺化套件，讓使用者可以快速產生可互動的地圖

- 使用前需要先安裝folium套件，語法為：

```
pip install folium
```

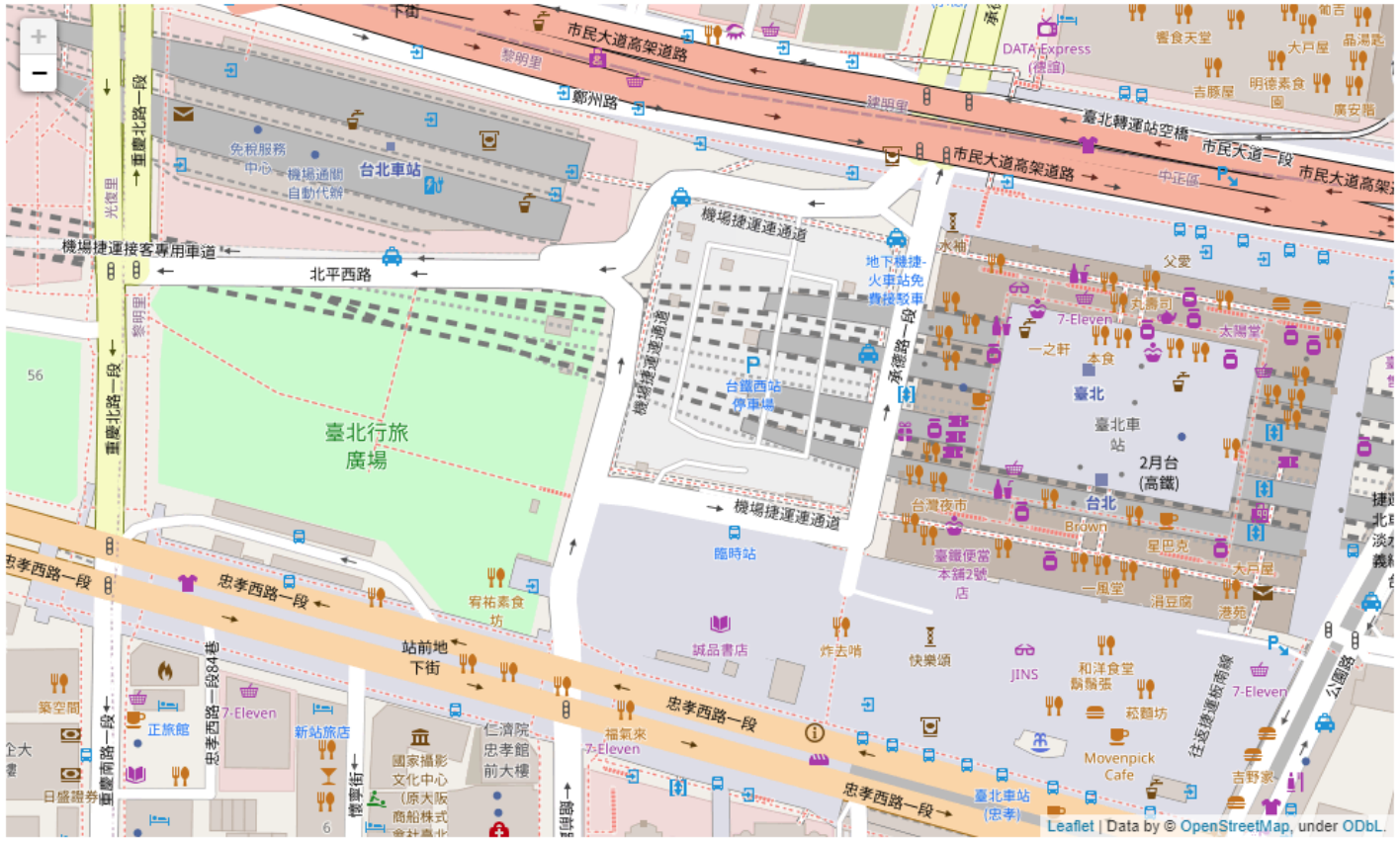


繪製地圖

- 在jupyter notebook裡輸入程式碼

```
In [1]: import numpy as np
        import folium

        fmap = folium.Map(location=[25.0477596,121.515526], zoom_start=20)
        fmap
        fmap.save('map.html')  #若想將檔案儲存，可以加上這句
```

Out[1]:



地圖標籤

- folium.Marker(location=[標籤經緯度], popup="提示字")

In [9]:
```
import numpy as np
import folium

fmap = folium.Map(location=[25.0477596,121.515526], tiles="OpenStreetMap", zoom_start=17)
fmap.add_child(folium.Marker(location=[25.0462322,121.5162631], popup='新光三越站前店'))  # 增加地圖標籤
fmap
```

Out[9]:

繪製多個地圖標籤

```
import numpy as np
import folium

list_station = [[35.69018, 139.70038,"新宿"], [35.67129, 139.70261, "原宿"], [35.65796, 139.70149, "渋谷"]]

fmap = folium.Map(location=[35.6761354,139.7475033], tiles="OpenStreetMap", zoom_start=13)
for i in list_station:
    fmap.add_child(folium.Marker(location=[i[0], i[1]], popup=i[2]))
fmap
```