11. Applied Finance I

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資料計算

- [ ] **Sum**
- [ ] **Mean**
- [ ] **Median**
- [ ] **Min (Minima)**
- [ ] **Max (Maxma)**

GroupBy

- GroupBy
  - Category, Numeric
- aggregate() : 聚合，max, min, sum
- Pivot Table: Excel 樞紐分析表

圖形表示

- Plot
  - Bmh
    - Label
- Errorbar
- Histogram
- Pie
- Legend

核密度圖（Seaborn-Kde）

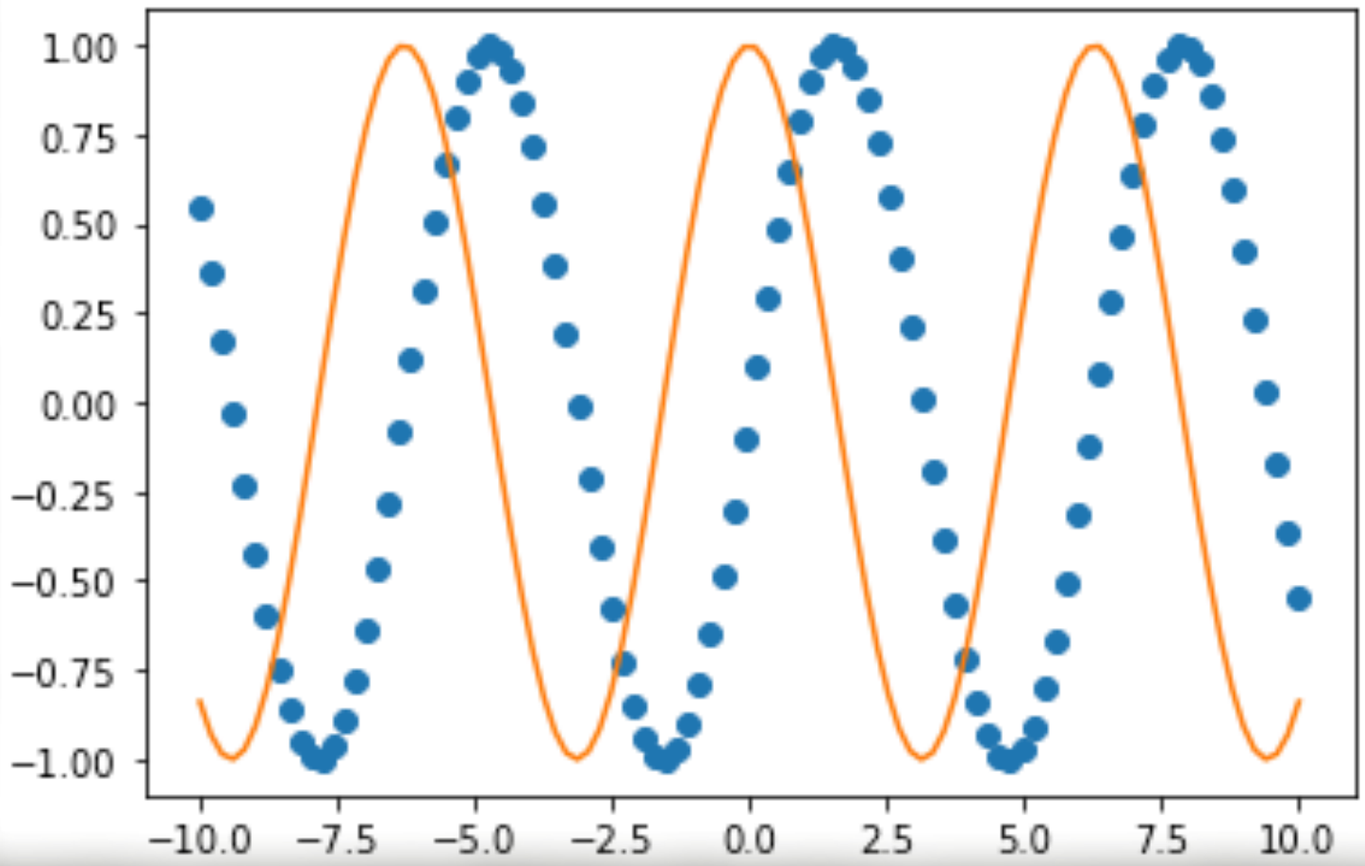
- 核密度圖顯示數值變量的分佈，它非常類似於直方圖。
- 用平滑的峰值函数 (“核”) 模擬觀察到的資料點，從而對真實的概率分布曲線條進行模擬。

Seaborn

- [ ] Bar
- [ ] Heatmap

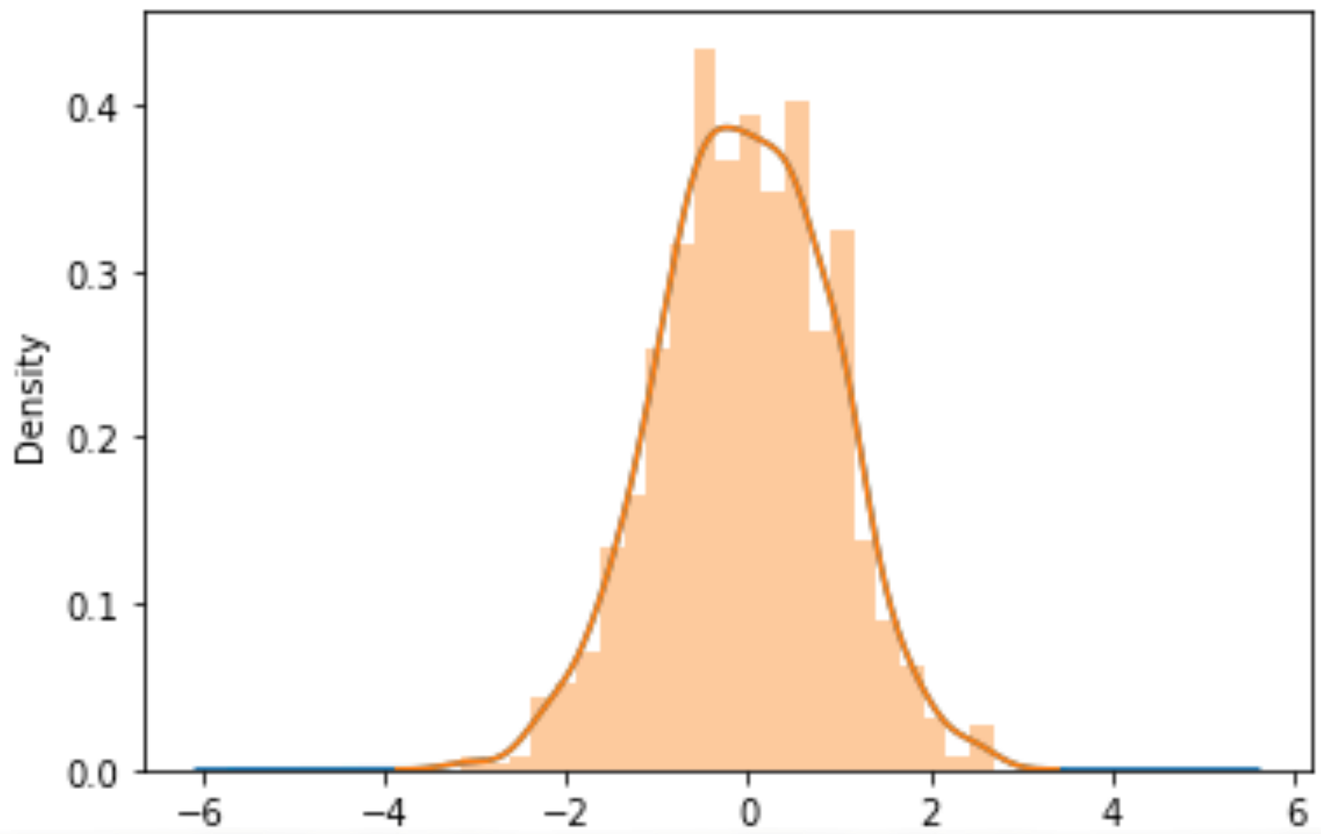
```
#plot
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
Wednesday = np.linspace(-10, 10, 100)
fig = plt.figure()
plt.plot(Wednesday, np.sin(Wednesday), 'o', Wednesday, np.cos(Wednesday), '-')
```

```
[<matplotlib.lines.Line2D at 0x125e8cf10>,
 <matplotlib.lines.Line2D at 0x125f07190>]
```



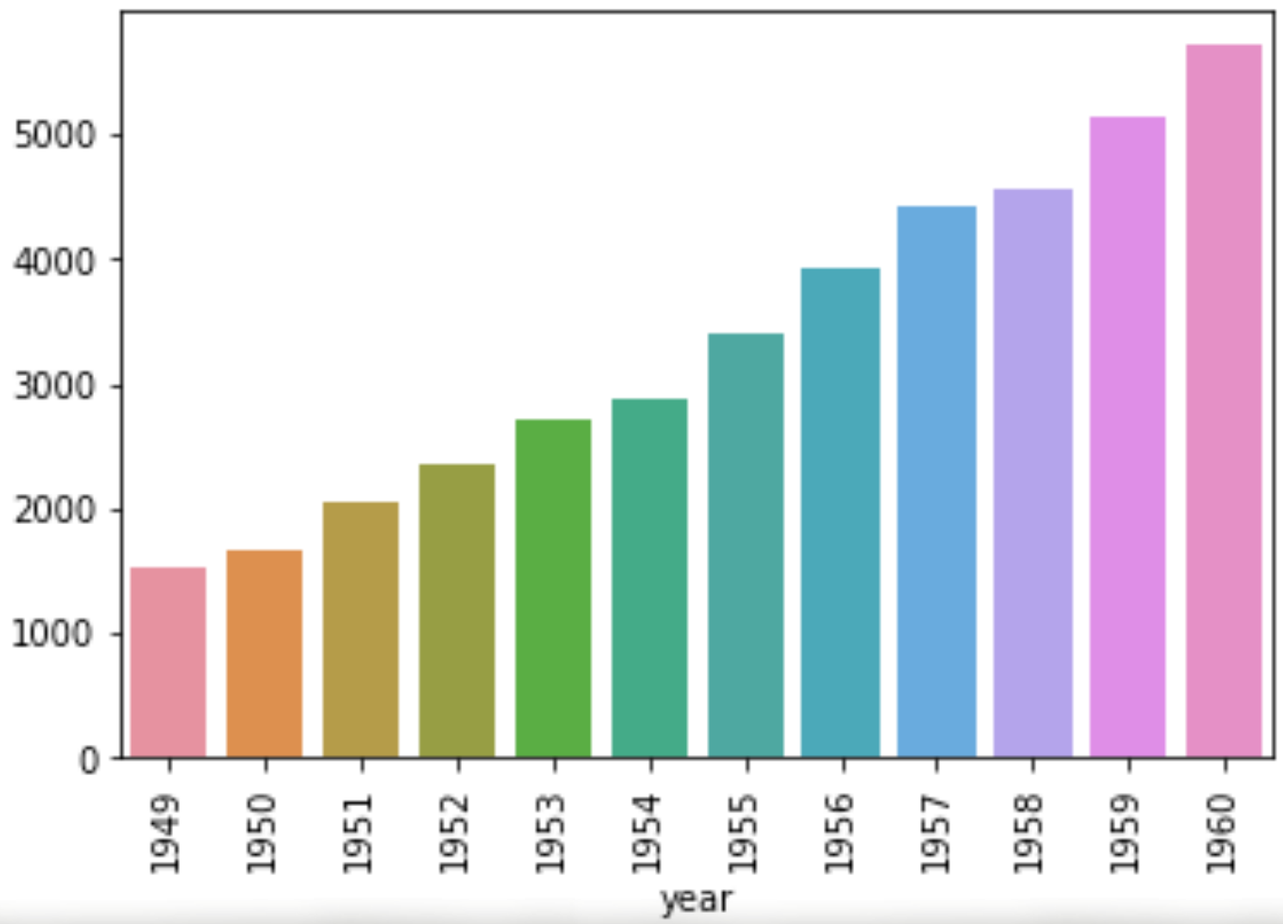
[40]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
sns.load_dataset('flights')
CHS = pd.Series(np.random.randn(1000))
CHS.plot(kind='kde')
sns.distplot(CHS)
#Seaborn histogram
```

[40]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x123399410>
```



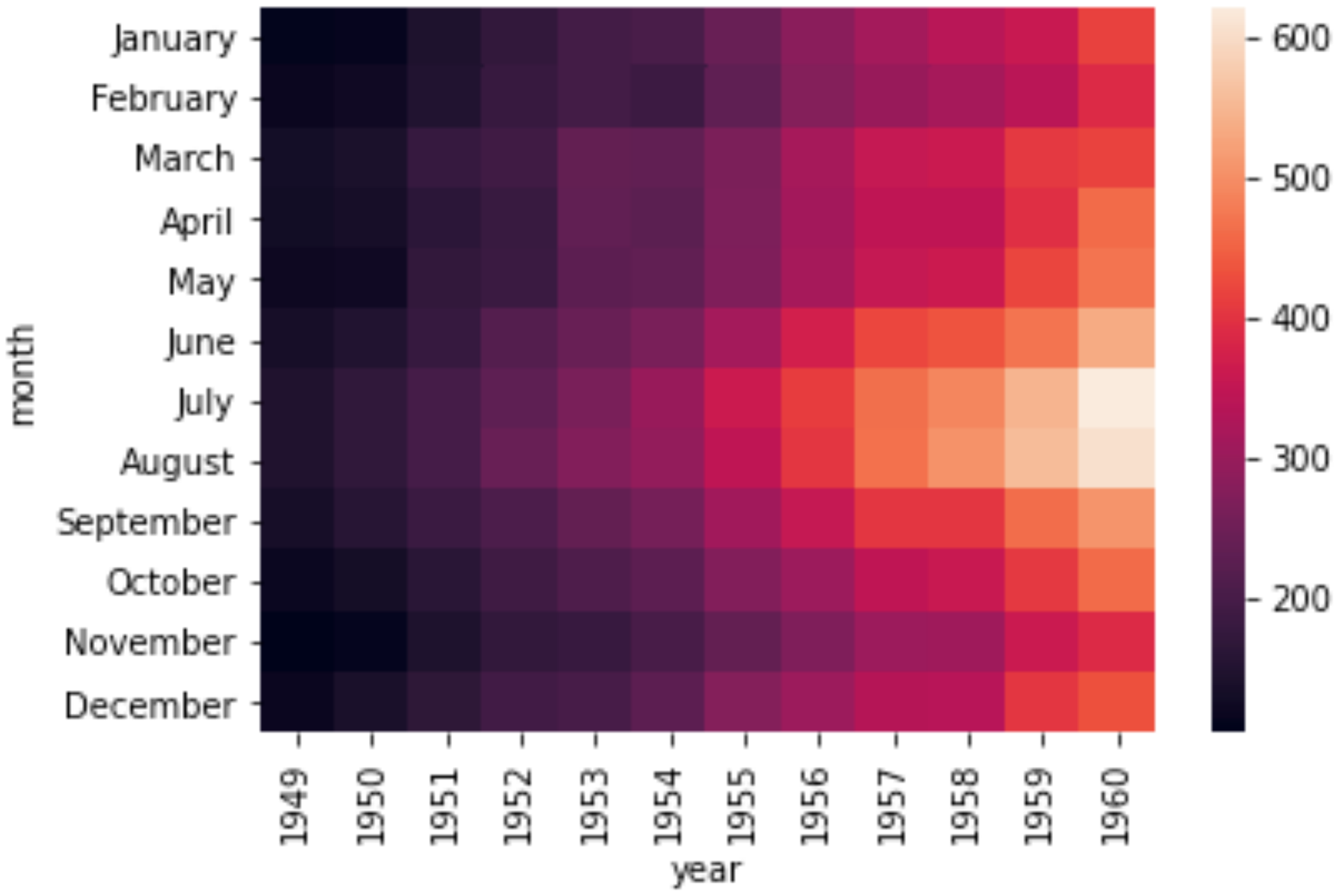
[50]:
```
DC_bar = sns.load_dataset('flights')
DC_bar = DC_bar.pivot(index='month', columns = 'year', values='passengers')
DC_bar.sum().plot(kind="bar")
sns.barplot(DC_bar.sum().index, DC_bar.sum().values)
```

[50]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1282f41d0>
```



[51]:
```
#heatmap
sns.heatmap(DC_bar)
```

[51]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x123490710>
```

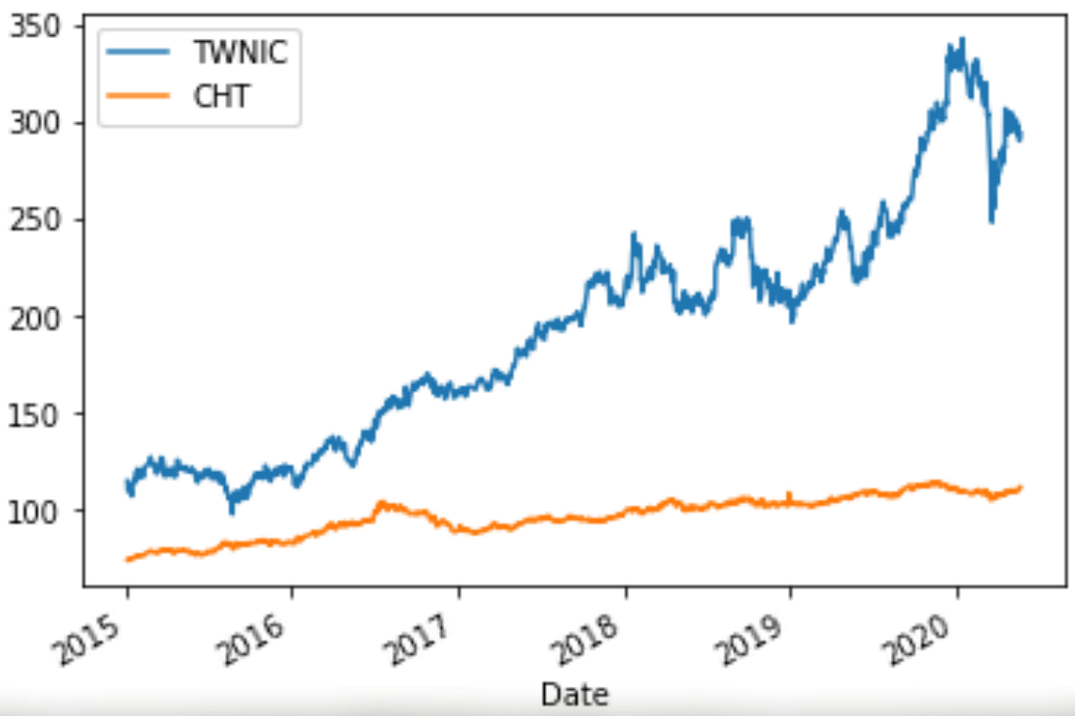


[61]:
```
import numpy as np
import pandas as pd
import pandas_datareader as pdr
import matplotlib.pyplot as plt
import seaborn as sns
import datetime as datetime
start = datetime.datetime(2015, 1, 1)
df_2330 = pdr.DataReader('2330.TW', 'yahoo', start=start)
df_2412 = pdr.DataReader('2412.TW', 'yahoo', start=start)

fig = plt.figure()

df_2330['Adj Close'].plot(label="TWNIC")
df_2412['Adj Close'].plot(label="CHT")
plt.legend()
```

[61]: `<matplotlib.legend.Legend at 0x128e18c90>`



pandas-datareader

- import pandas_datareader as per
  df_2330 = pdr.DataReader(‘2330’.TW, ‘yahoo’)

作業

- [ ] 從外部資料庫匯入資料 (seaborn 或 datareader, 或其他資料庫)，選擇一個最能呈現該資料特性的圖形呈現並說明之。
  不限制使用 python，可以使任何你喜歡的工具。

投資組合風險評估

```
import datetime as datetime
start = datetime.datetime(2020, 1, 1)
df_CTC = pdr.DataReader('2412.TW', 'yahoo', start=start) #20%
df_EVA = pdr.DataReader('2618.TW', 'yahoo', start=start) #50%
df_TRU = pdr.DataReader('2103.TW', 'yahoo', start=start) #30#

for stock in [df_CTC, df_EVA, df_TRU]:
    stock['normalized_price']=stock['Adj Close']/stock['Adj Close'].iloc[0]

for stock, weight in zip([df_CTC, df_EVA, df_TRU], [0.2, 0.5, 0.3]):
    stock['weighted daily return'] = stock['normalized_price'] * weight

stock['weighted daily return']
```