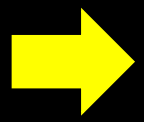
Python 計算成長率

成長率 Growth Rate

raw_data

NAME	PRODUCT	YEAR	PRICE
BIG	A	2020	100
BIG	B	2020	200
BIG	C	2020	300
BIG	A	2021	400
BIG	B	2021	500
BIG	C	2021	600
MEDIEN	A	2020	700
MEDIEN	B	2020	800
MEDIEN	C	2020	900
MEDIEN	A	2021	1,000
MEDIEN	B	2021	1,100
MEDIEN	C	2021	1,200
SMALL	A	2020	1,300
SMALL	B	2020	1,400
SMALL	C	2020	1,500
SMALL	B	2021	1,600
SMALL	C	2021	1,700
SMALL	A	2021	1,800



gr

NAME	PRODUCT	YEAR	PRICE	GROWTH RATE
BIG	A	2020	100	--
BIG	A	2021	400	300.00%
BIG	B	2020	200	--
BIG	B	2021	500	150.00%
BIG	C	2020	300	--
BIG	C	2021	600	100.00%
MEDIEN	A	2020	700	--
MEDIEN	A	2021	1000	42.86%
MEDIEN	B	2020	800	--
MEDIEN	B	2021	1100	37.50%
MEDIEN	C	2020	900	--
MEDIEN	C	2021	1200	33.33%
SMALL	A	2020	1300	--
SMALL	A	2021	1800	38.46%
SMALL	B	2020	1400	--
SMALL	B	2021	1600	14.29%
SMALL	C	2020	1500	--
SMALL	C	2021	1700	13.33%

Step 1 : 讀取 Excel 檔

pandas.read_excel( )

Step 2 : 計算成長率

pandas.DataFrame.sort_values( )

pandas.DataFrame.groupby( )

pandas.DataFrame.pct_change( )

Step 3 : 成長率以百分比顯示

pandas.DataFrame.apply( )

Step 4 : DataFrame 寫入 Excel 檔

pandas.DataFrame.to_excel( )

Step 1 : pandas.read_excel( )

In [2]:
```
xlsx_path = 'D:\RPA_UiPath\Python x RPA\Calculate Growth Rate\Input\SampleData.xlsx'

raw_data = pd.read_excel( xlsx_path )
raw_data
```

Out[2]:

	NAME	PRODUCT	YEAR	PRICE
0	BIG	A	2020	100
1	BIG	B	2020	200
2	BIG	C	2020	300
3	BIG	A	2021	400
4	BIG	B	2021	500
5	BIG	C	2021	600
6	MEDIEN	A	2020	700
7	MEDIEN	B	2020	800
8	MEDIEN	C	2020	900
9	MEDIEN	A	2021	1000
10	MEDIEN	B	2021	1100
11	MEDIEN	C	2021	1200

Step 2 : pandas.DataFrame.sort_values( )
pandas.DataFrame.groupby( )
pandas.DataFrame.pct_change( )

In [3]:
```
raw_data['GROWTH RATE'] = raw_data.sort_values(['YEAR']).groupby(['NAME','PRODUCT'])[['PRICE']].pct_change( )
raw_data.fillna( '--', inplace = True )
gr = raw_data.sort_values(['NAME','PRODUCT','YEAR'])
gr
```

Out[3]:

	NAME	PRODUCT	YEAR	PRICE	GROWTH RATE
0	BIG	A	2020	100	--
3	BIG	A	2021	400	3
1	BIG	B	2020	200	--
4	BIG	B	2021	500	1.5
2	BIG	C	2020	300	--
5	BIG	C	2021	600	1
6	MEDIEN	A	2020	700	--
9	MEDIEN	A	2021	1000	0.428571
7	MEDIEN	B	2020	800	--
10	MEDIEN	B	2021	1100	0.375
8	MEDIEN	C	2020	900	--

Step 3 : pandas.DataFrame.apply( )

```
In [4]: gr['GROWTH RATE'] = gr.apply( lambda x: '{:.2%}'.format(round(x['GROWTH RATE'],4)) if x['GROWTH RATE']!='--' else '--', axis=1 )
gr
```

Out[4]:

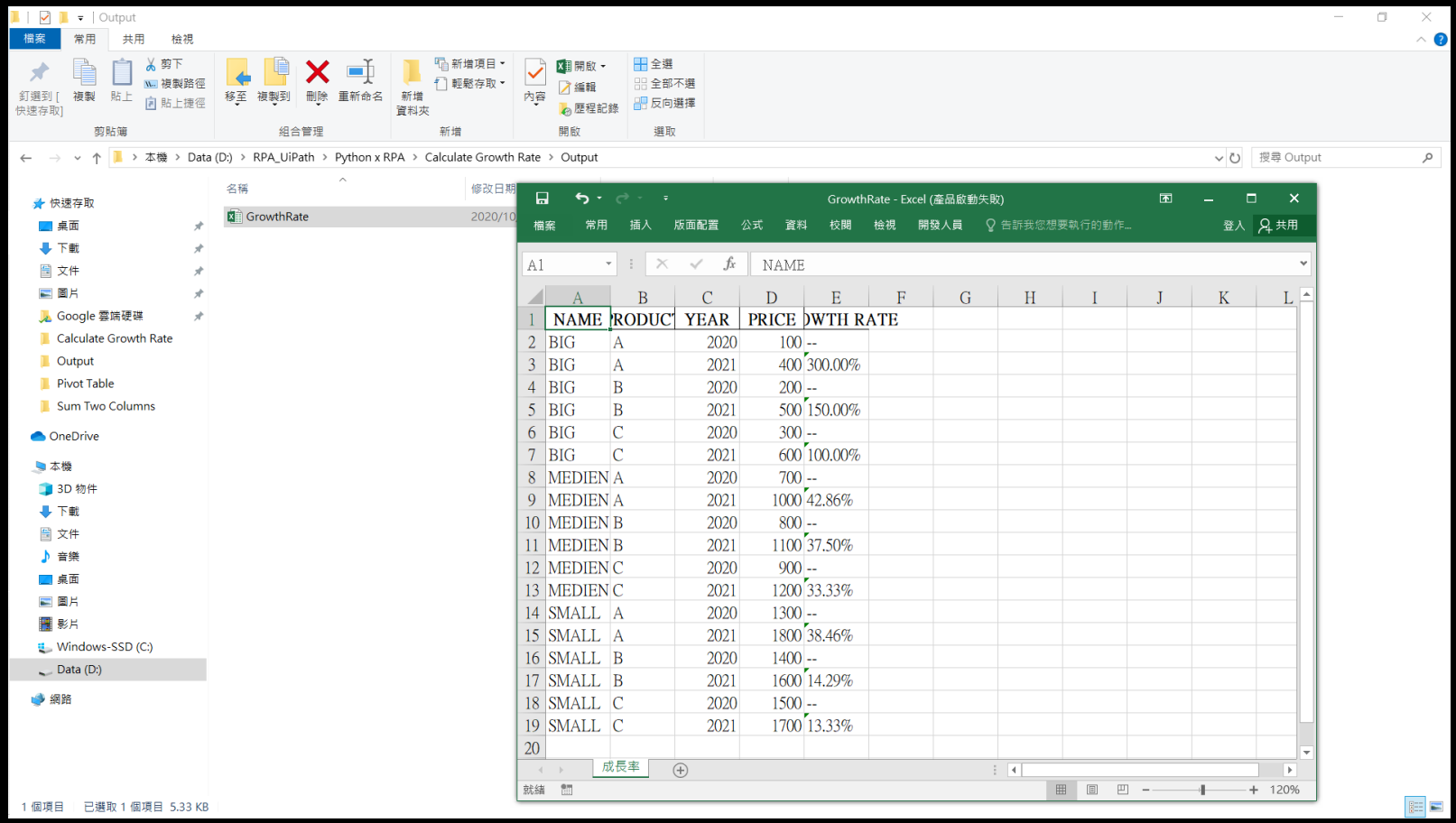
	NAME	PRODUCT	YEAR	PRICE	GROWTH RATE
0	BIG	A	2020	100	--
3	BIG	A	2021	400	300.00%
1	BIG	B	2020	200	--
4	BIG	B	2021	500	150.00%
2	BIG	C	2020	300	--
5	BIG	C	2021	600	100.00%
6	MEDIEN	A	2020	700	--
9	MEDIEN	A	2021	1000	42.86%
7	MEDIEN	B	2020	800	--
10	MEDIEN	B	2021	1100	37.50%
8	MEDIEN	C	2020	900	--
11	MEDIEN	C	2021	1200	33.33%

Step 4 : pandas.DataFrame.to_excel( )

```
In [5]: output_path = 'D:\RPA_UiPath\Python x RPA\Calculate Growth Rate\Output\GrowthRate.xlsx'

        gr.to_excel( output_path, sheet_name = '成長率', index = False )
```

Output



	A	B	C	D	E
1	NAME	PRODUCT	YEAR	PRICE	OWTH RATE
2	BIG	A	2020	100	--
3	BIG	A	2021	400	300.00%
4	BIG	B	2020	200	--
5	BIG	B	2021	500	150.00%
6	BIG	C	2020	300	--
7	BIG	C	2021	600	100.00%
8	MEDIEN	A	2020	700	--
9	MEDIEN	A	2021	1000	42.86%
10	MEDIEN	B	2020	800	--
11	MEDIEN	B	2021	1100	37.50%
12	MEDIEN	C	2020	900	--
13	MEDIEN	C	2021	1200	33.33%
14	SMALL	A	2020	1300	--
15	SMALL	A	2021	1800	38.46%
16	SMALL	B	2020	1400	--
17	SMALL	B	2021	1600	14.29%
18	SMALL	C	2020	1500	--
19	SMALL	C	2021	1700	13.33%
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