Banks_Portfolio

September 29, 2021

1 Bank Portfolio

1.1 Invest in Bank Stocks

[1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import math

import warnings
warnings.filterwarnings("ignore")

# fix_yahoo_finance is used to fetch data
import fix_yahoo_finance as yf
yf.pdr_override()
```

[2]:
```
# input
symbols = ['BAC','WFC','MS','C']
start = '2010-01-01'
end = '2019-01-01'

# Read data
df = yf.download(symbols,start,end)['Adj Close']

# View Columns
df.head()
```

```
[**********100%**********]  4 of 4 downloaded
```

[2]:

Date	BAC	C	MS	WFC
2010-01-04	14.176558	31.377235	26.338934	21.039022
2010-01-05	14.637363	32.576950	27.301834	21.616585
2010-01-06	14.809035	33.592110	27.651201	21.647402
2010-01-07	15.296949	33.684391	28.051693	22.432901
2010-01-08	15.161416	33.130672	27.480778	22.224974

[3]:
```
df.tail()
```

[3]:

Date	BAC	C	MS	WFC
2018-12-24	22.345720	47.898232	35.965076	41.917015
2018-12-26	23.702393	50.017963	38.190422	43.830200
2018-12-27	23.957996	50.338848	38.540257	43.772518
2018-12-28	23.977657	50.397186	38.258450	44.012867
2018-12-31	24.223431	50.620831	38.530544	44.301289

[4]:
```
from datetime import datetime
from dateutil import relativedelta

d1 = datetime.strptime(start, "%Y-%m-%d")
d2 = datetime.strptime(end, "%Y-%m-%d")
delta = relativedelta.relativedelta(d2,d1)
print('How many years of investing?')
print('%s years' % delta.years)
```

```
How many years of investing?
9 years
```

[5]:
```
for s in symbols:
    df[s].plot(label = s, figsize = (15,10))
plt.legend()
```

[5]:
```
<matplotlib.legend.Legend at 0x2182b981198>
```

[6]:
```
for s in symbols:
    print(s + ":",  df[s].max())
```

```
BAC: 31.820911
WFC: 61.585838
MS: 56.251183
C: 76.178528
```

[7]:
```
for s in symbols:
    print(s + ":",  df[s].min())
```

```
BAC: 4.543722
WFC: 17.961151
MS: 10.76533
C: 21.338135
```

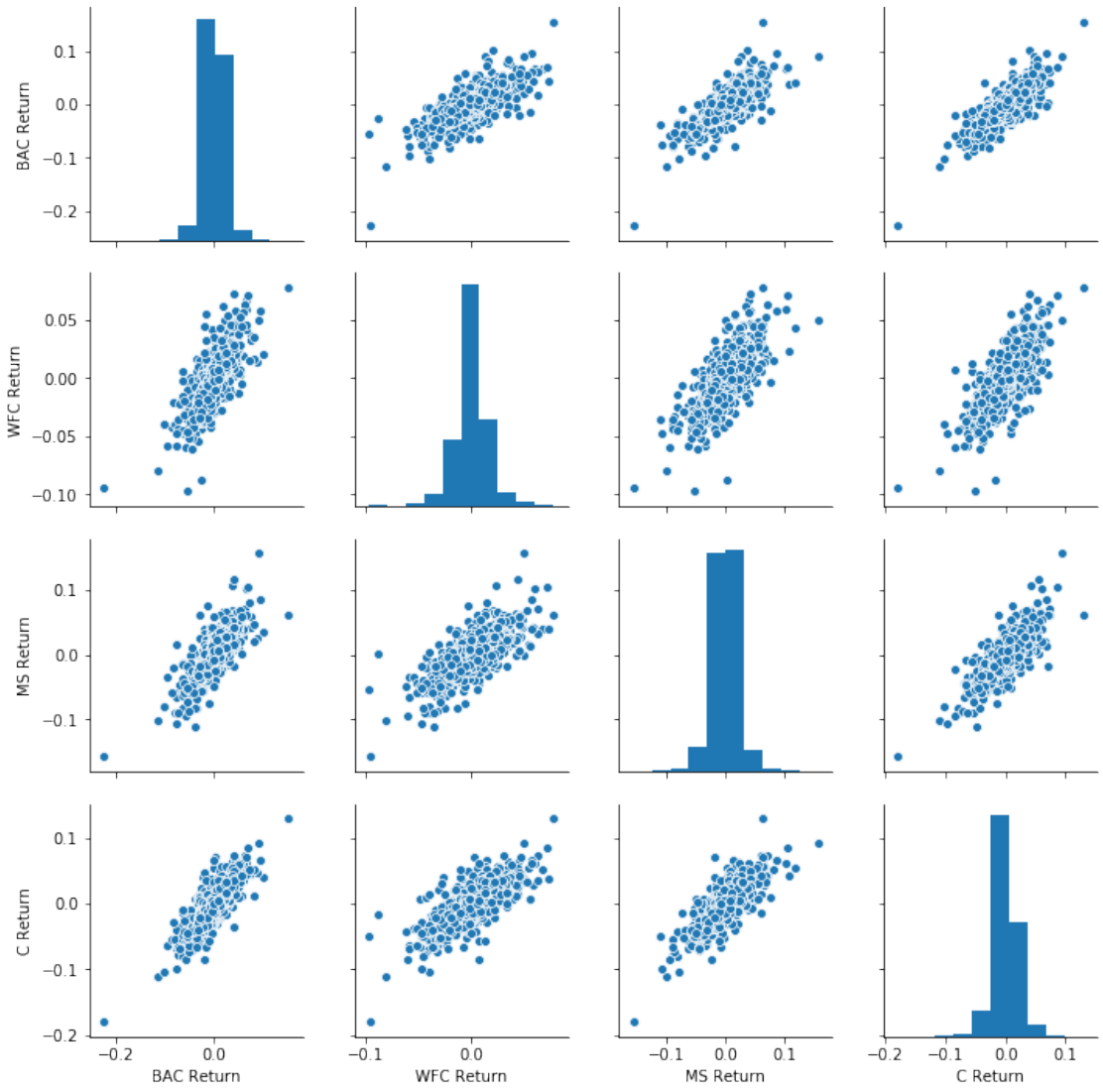
[8]:
```
returns = pd.DataFrame()
for s in symbols:
    returns[s + " Return"] = (np.log(1 + df[s].pct_change())).dropna()

returns.head(4)
```

[8]:

Date	BAC Return	WFC Return	MS Return	C Return
2010-01-05	0.031988	0.027082	0.035906	0.037522
2010-01-06	0.011660	0.001425	0.012715	0.030686
2010-01-07	0.032416	0.035643	0.014380	0.002743
2010-01-08	-0.008900	-0.009312	-0.020562	-0.016575

[9]:
```
sns.pairplot(returns[1:])
```

[9]:
```
<seaborn.axisgrid.PairGrid at 0x2182bd33dd8>
```

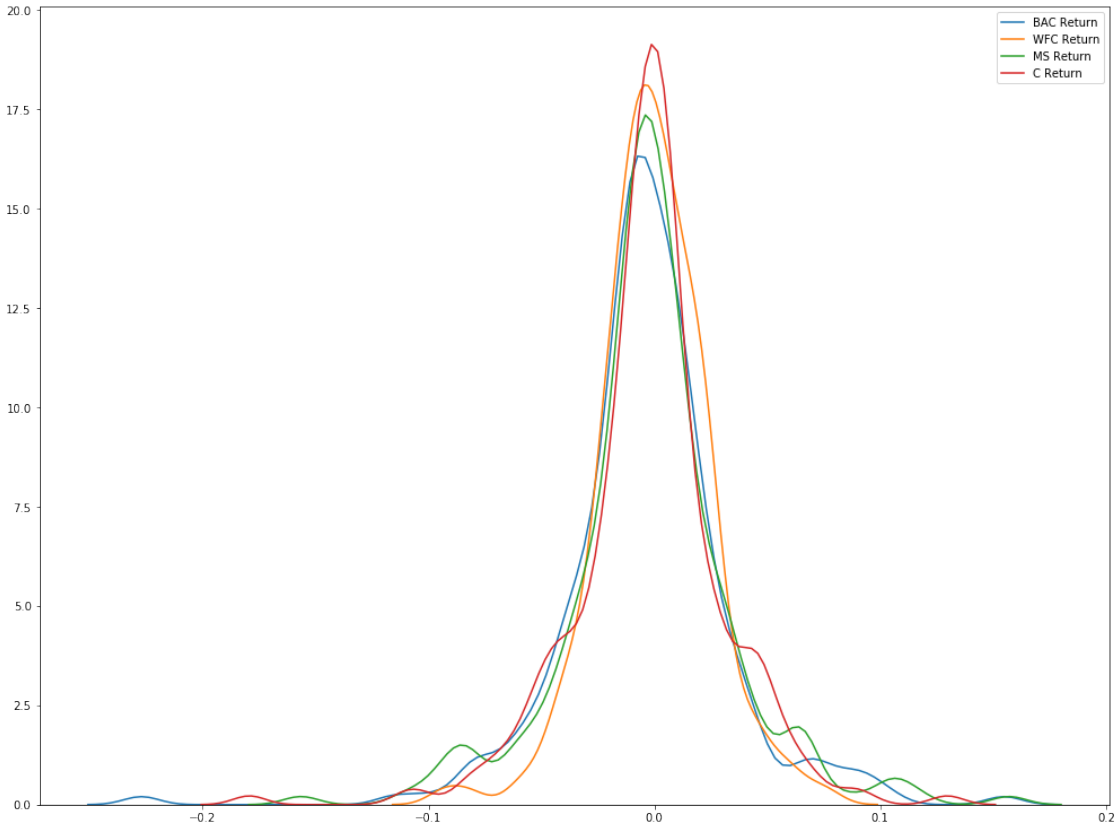


[10]:
```
# dates each bank stock had the best and worst single day returns.
print('Best Day Returns')
print('-'*20)
print(returns.idxmax())
print('\n')
print('Worst Day Returns')
print('-'*20)
print(returns.idxmin())
```

```
Best Day Returns
--------------------
BAC Return   2011-08-09
WFC Return   2011-08-09
MS Return    2011-10-27
```

```
C Return      2011-08-09
dtype: datetime64[ns]


Worst Day Returns
--------------------
BAC Return    2011-08-08
WFC Return    2018-02-05
MS Return     2011-08-08
C Return      2011-08-08
dtype: datetime64[ns]
```

[11]:
```
plt.figure(figsize=(17,13))

for r in returns:
    sns.kdeplot(returns.ix["2011-01-01" : "2011-12-31 "][r])
```



[12]:
```
returns.corr()
```

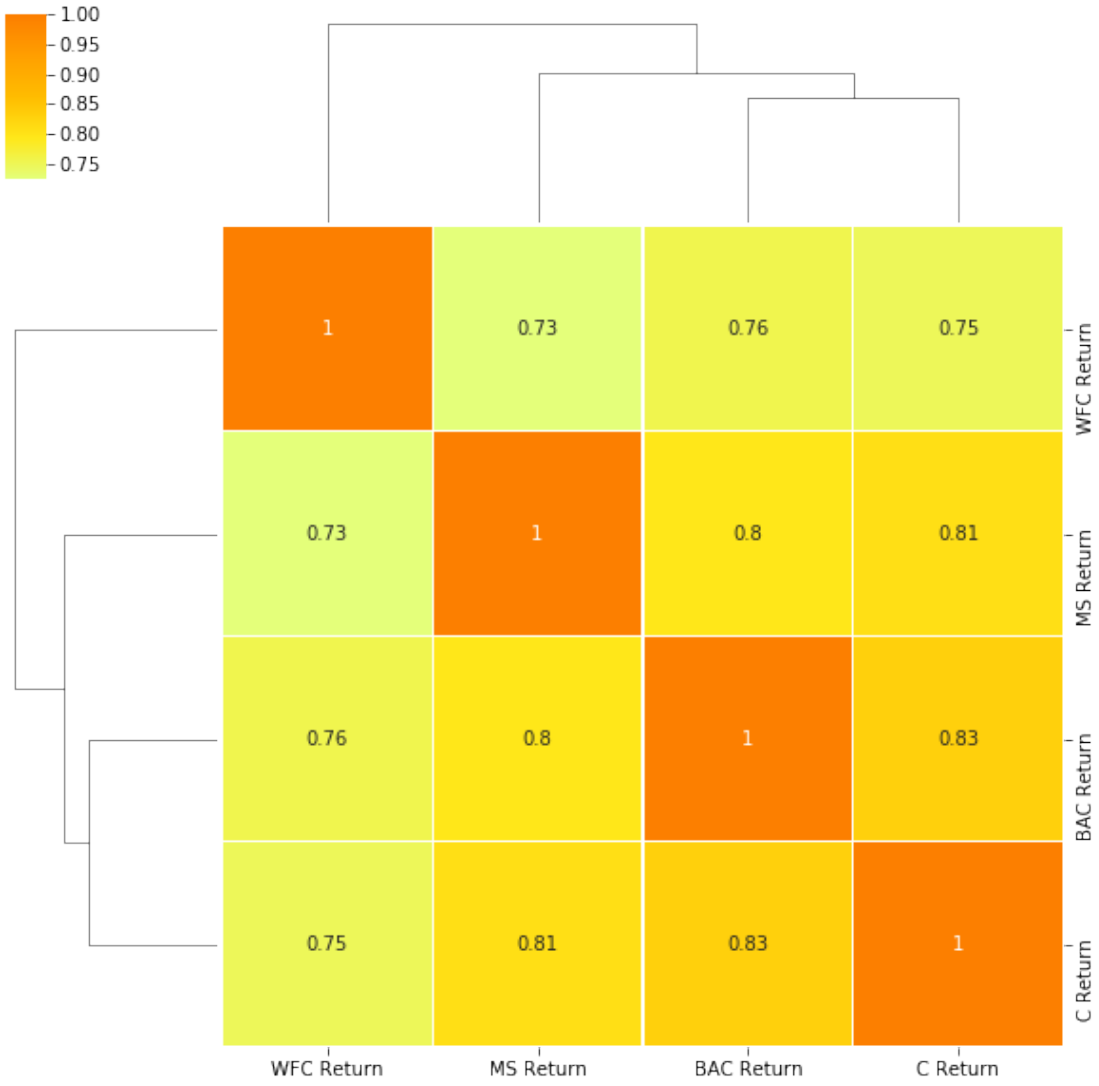
[12]:

	BAC Return	WFC Return	MS Return	C Return
BAC Return	1.000000	0.757169	0.795558	0.832349

```
WFC Return    0.757169    1.000000    0.725683  0.750073
MS Return     0.795558    0.725683    1.000000  0.808386
C Return      0.832349    0.750073    0.808386  1.000000
```

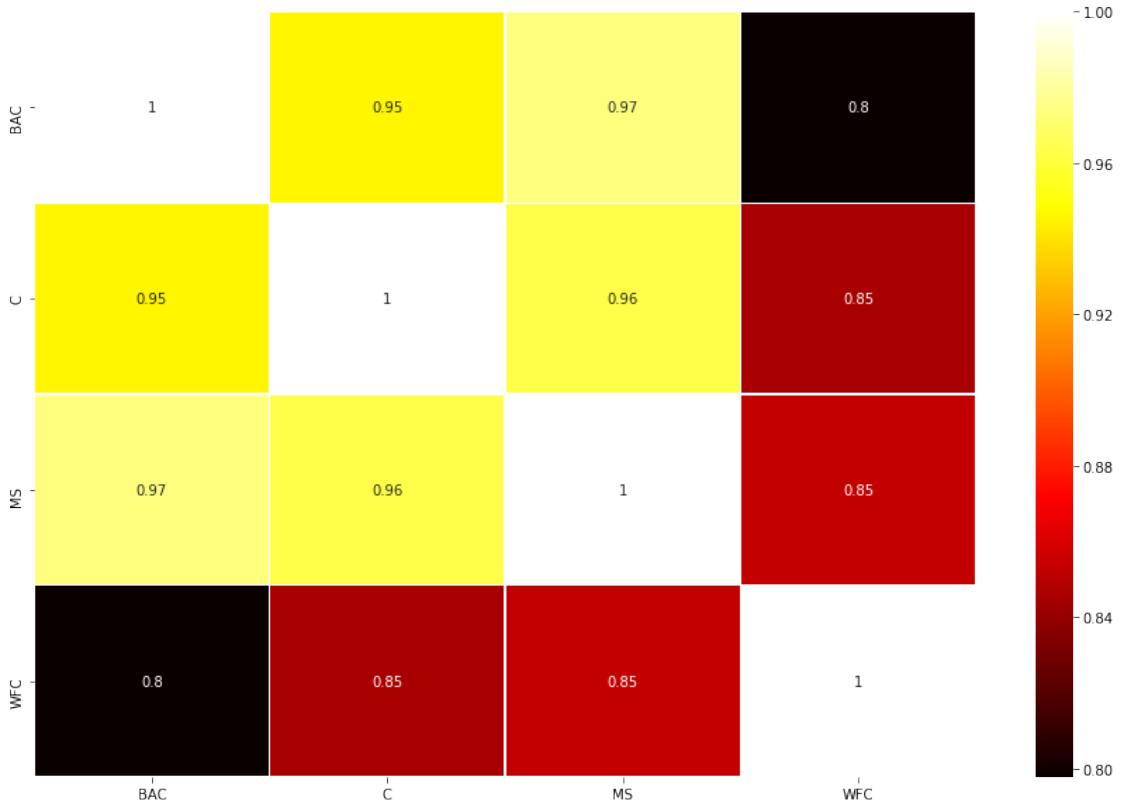
[13]:
```
# Heatmap for return of all the banks
plt.figure(figsize=(15,10))
sns.heatmap(returns.corr(), cmap="cool",linewidths=.1, annot= True)

sns.clustermap(returns.corr(), cmap="Wistia",linewidths=.1, annot= True)
```

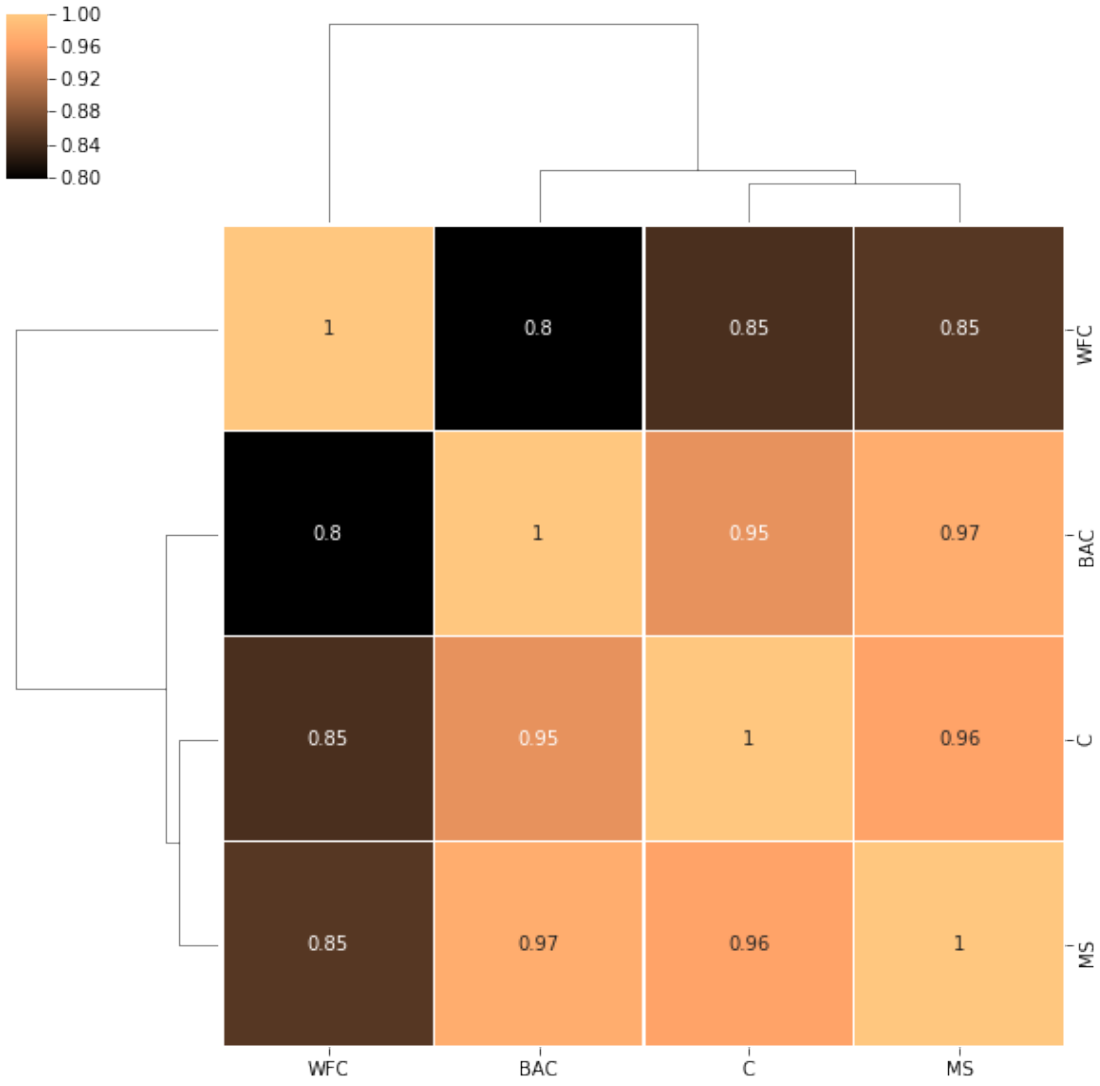
[13]: <seaborn.matrix.ClusterGrid at 0x2182e4a1da0>



[14]:
```
plt.figure(figsize=(15,10))
sns.heatmap(df.corr(), cmap="hot",linewidths=.1, annot= True)

sns.clustermap(df.corr(), cmap="copper",linewidths=.1, annot= True)
```

[14]: <seaborn.matrix.ClusterGrid at 0x2182e4a7b38>


BAC
C
MS
WFC
1
0.95
0.97
0.8
0.95
1
0.96
0.85
0.97
0.96
1
0.85
0.8
0.85
0.85
1
BAC
C
MS
WFC
1.00
0.96
0.92
0.88
0.84
0.80



[15]:
```
Cash = 100000
print('Percentage of invest:')
percent_invest = [0.25, 0.25, 0.25, 0.25]
for i, x in zip(df.columns, percent_invest):
    cost = x * Cash
    print('{}: {}'.format(i, cost))
```

```
Percentage of invest:
BAC: 25000.0
C: 25000.0
MS: 25000.0
WFC: 25000.0
```

[16]:
```
print('Number of Shares:')
percent_invest = [0.25, 0.25, 0.25, 0.25]
for i, x, y in zip(df.columns, percent_invest, df.iloc[0]):
    cost = x * Cash
    shares = int(cost/y)
    print('{}: {}'.format(i, shares))
```

```
Number of Shares:
BAC: 1763
C: 796
MS: 949
WFC: 1188
```

[17]:
```
print('Beginning Value:')
percent_invest = [0.25, 0.25, 0.25, 0.25]
for i, x, y in zip(df.columns, percent_invest, df.iloc[0]):
    cost = x * Cash
    shares = int(cost/y)
    Begin_Value = round(shares * y, 2)
    print('{}: ${}'.format(i, Begin_Value))
```

```
Beginning Value:
BAC: $24993.27
C: $24976.28
MS: $24995.65
WFC: $24994.36
```

[18]:
```
print('Current Value:')
percent_invest = [0.25, 0.25, 0.25, 0.25]
for i, x, y, z in zip(df.columns, percent_invest, df.iloc[0], df.iloc[-1]):
    cost = x * Cash
    shares = int(cost/y)
    Current_Value = round(shares * z, 2)
    print('{}: ${}'.format(i, Current_Value))
```

```
Current Value:
BAC: $42705.91
C: $40294.18
MS: $36565.49
WFC: $52629.93
```

[19]:
```
result = []
percent_invest = [0.25, 0.25, 0.25, 0.25]
for i, x, y, z in zip(df.columns, percent_invest, df.iloc[0], df.iloc[-1]):
    cost = x * Cash
    shares = int(cost/y)
    Current_Value = round(shares * z, 2)
    result.append(Current_Value)
```

```
print('Total Value: $%s' % round(sum(result),2))
```

```
Total Value: $172195.51
```