# Obama_Stock_Portfolio_Coals

September 29, 2021

## 1 Barack Obama Stock Portfolio Anti-Coal

During Obama Presidental, he shut down some coal companies.

https://en.wikipedia.org/wiki/Presidency_of_Barack_Obama

[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 = ['BHP','VALE','HNRG','ARLP','NRP']
start = '2009-01-01'
end = '2017-01-01'

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

# View Columns
df.head()
```

```
[**********************100%**********************]  5 of 5 downloaded
```

[2]:

| Date | ARLP | BHP | HNRG | NRP | VALE |
|---|---|---|---|---|---|
| 2009-01-02 | 5.675083 | 28.928493 | 2.253366 | 143.547302 | 8.889145 |
| 2009-01-05 | 5.859945 | 28.960270 | 2.253366 | 151.485382 | 9.502422 |
| 2009-01-06 | 6.130282 | 30.511261 | 2.253366 | 160.967026 | 10.183092 |
| 2009-01-07 | 5.806278 | 28.222916 | 2.253366 | 153.249390 | 9.219371 |

```
2009-01-08  5.915604  28.483540  2.253366  156.777435   9.468725
```

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

[3]:
```
                 ARLP        BHP      HNRG        NRP      VALE
Date
2016-12-23  16.632372  29.384541  8.283847  28.197189  7.091769
2016-12-27  16.848373  29.575399  8.274623  28.323261  7.266534
2016-12-28  16.272366  30.056707  8.422219  27.524832  7.376912
2016-12-29  15.804354  30.098196  8.431442  27.903034  7.275732
2016-12-30  16.164362  29.691578  8.385319  27.146627  7.008986
```

[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?
8 years
```

[5]:
```
from datetime import datetime

def calculate_years(start, end):
    date_format = "%Y-%m-%d"
    a = datetime.strptime(start, date_format).year
    b = datetime.strptime(end, date_format).year
    years = b - a

    return years
```

[6]:
```
print(calculate_years(start, end), 'years')
```

```
8 years
```

[7]:
```
Cash = 100000
print('Percentage of invest:')
percent_invest = [0.20, 0.20, 0.20, 0.20, 0.20]
for i, x in zip(df.columns, percent_invest):
    cost = x * Cash
    print('{}: {}'.format(i, cost))
```

```
Percentage of invest:
ARLP: 20000.0
BHP: 20000.0
```

```
HNRG: 20000.0
NRP: 20000.0
VALE: 20000.0
```

[8]:
```
print('Number of Shares:')
percent_invest = [0.20, 0.20, 0.20, 0.20, 0.20]
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:
ARLP: 3524
BHP: 691
HNRG: 8875
NRP: 139
VALE: 2249
```

[9]:
```
print('Beginning Value:')
percent_invest = [0.20, 0.20, 0.20, 0.20, 0.20]
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:
ARLP: $19998.99
BHP: $19989.59
HNRG: $19998.62
NRP: $19953.07
VALE: $19991.69
```

[10]:
```
print('Current Value:')
percent_invest = [0.20, 0.20, 0.20, 0.20, 0.20]
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))
```

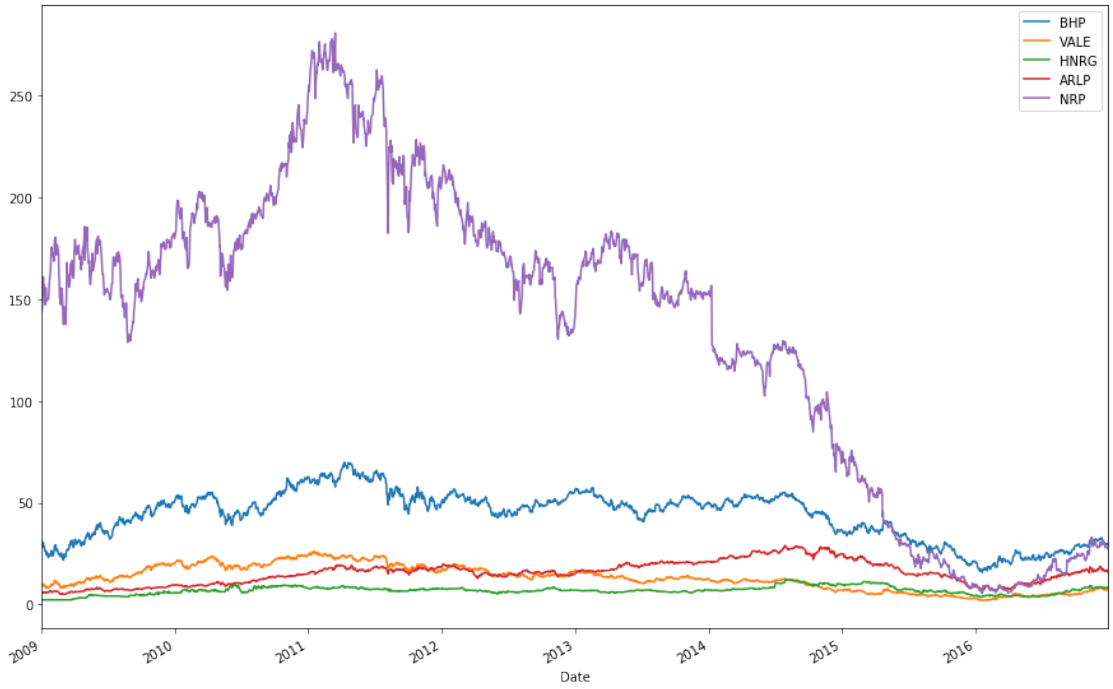
```
Current Value:
ARLP: $56963.21
BHP: $20516.88
HNRG: $74419.71
NRP: $3773.38
VALE: $15763.21
```

[11]:
```
result = []
percent_invest = [0.20, 0.20, 0.20, 0.20, 0.20]
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: $171436.39
```

[12]:
```
for s in symbols:
    df[s].plot(label = s, figsize = (15,10))
plt.legend()
```

[12]: <matplotlib.legend.Legend at 0x221a82b6cf8>




[13]:
```
df.min()
```

[13]:
```
ARLP     4.976706
BHP     15.747570
HNRG     2.215809
NRP      5.403183
VALE     1.965798
dtype: float64
```

[14]:
```
for s in symbols:
    print(s + ":",  df[s].max())
```

```
BHP: 69.879852
VALE: 26.171221
HNRG: 12.330428999999999
ARLP: 28.93988
NRP: 280.747131
```

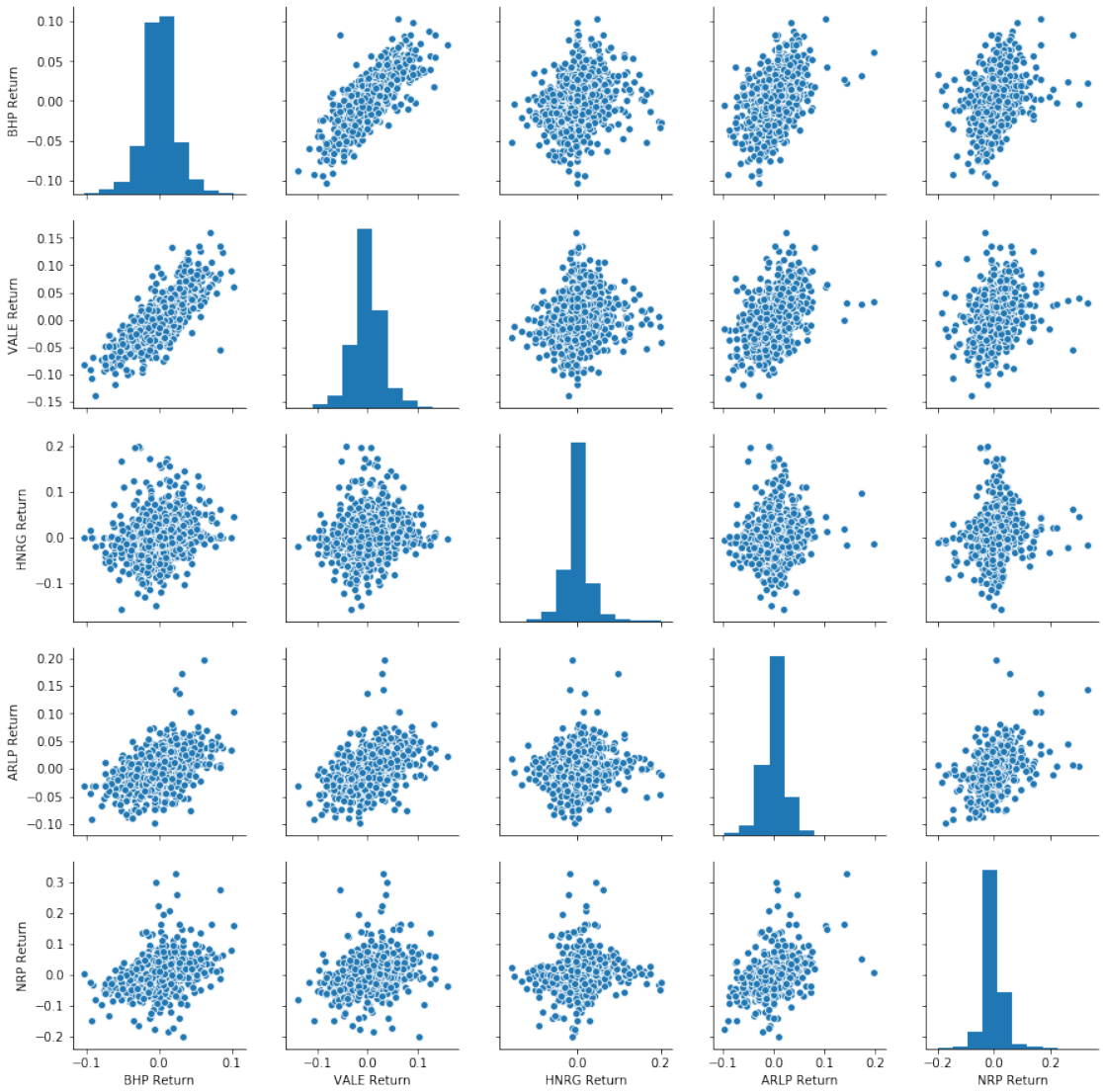
[15]:
```
# Creating a Return Data Frame for all individual banks stocks:
returns = pd.DataFrame()
for s in symbols:
    returns[s + " Return"] = df[s].pct_change().dropna()

returns.head(4)
```

[15]:

| Date | BHP Return | VALE Return | HNRG Return | ARLP Return | NRP Return |
|---|---|---|---|---|---|
| 2009-01-05 | 0.001098 | 0.068992 | 0.0 | 0.032574 | 0.055299 |
| 2009-01-06 | 0.053556 | 0.071631 | 0.0 | 0.046133 | 0.062591 |
| 2009-01-07 | -0.075000 | -0.094639 | 0.0 | -0.052853 | -0.047945 |
| 2009-01-08 | 0.009234 | 0.027047 | 0.0 | 0.018829 | 0.023022 |

[16]:
```
sns.pairplot(returns[1:] )
```

[16]:
```
<seaborn.axisgrid.PairGrid at 0x221a8337b38>
```




[17]:
```
# dates each bank stock had the best and worst single day returns.
print(returns.idxmax())
```

```
BHP Return    2011-08-09
VALE Return   2016-02-04
HNRG Return   2009-08-31
ARLP Return   2016-01-26
NRP Return    2016-01-22
dtype: datetime64[ns]
```

[18]:
```
# dates each bank stock had the best and worst single day returns.
print(returns.idxmin())
```

```
BHP Return    2009-01-20
```

```
VALE Return   2016-03-08
HNRG Return   2011-08-10
ARLP Return   2016-01-19
NRP Return    2015-04-22
dtype: datetime64[ns]
```

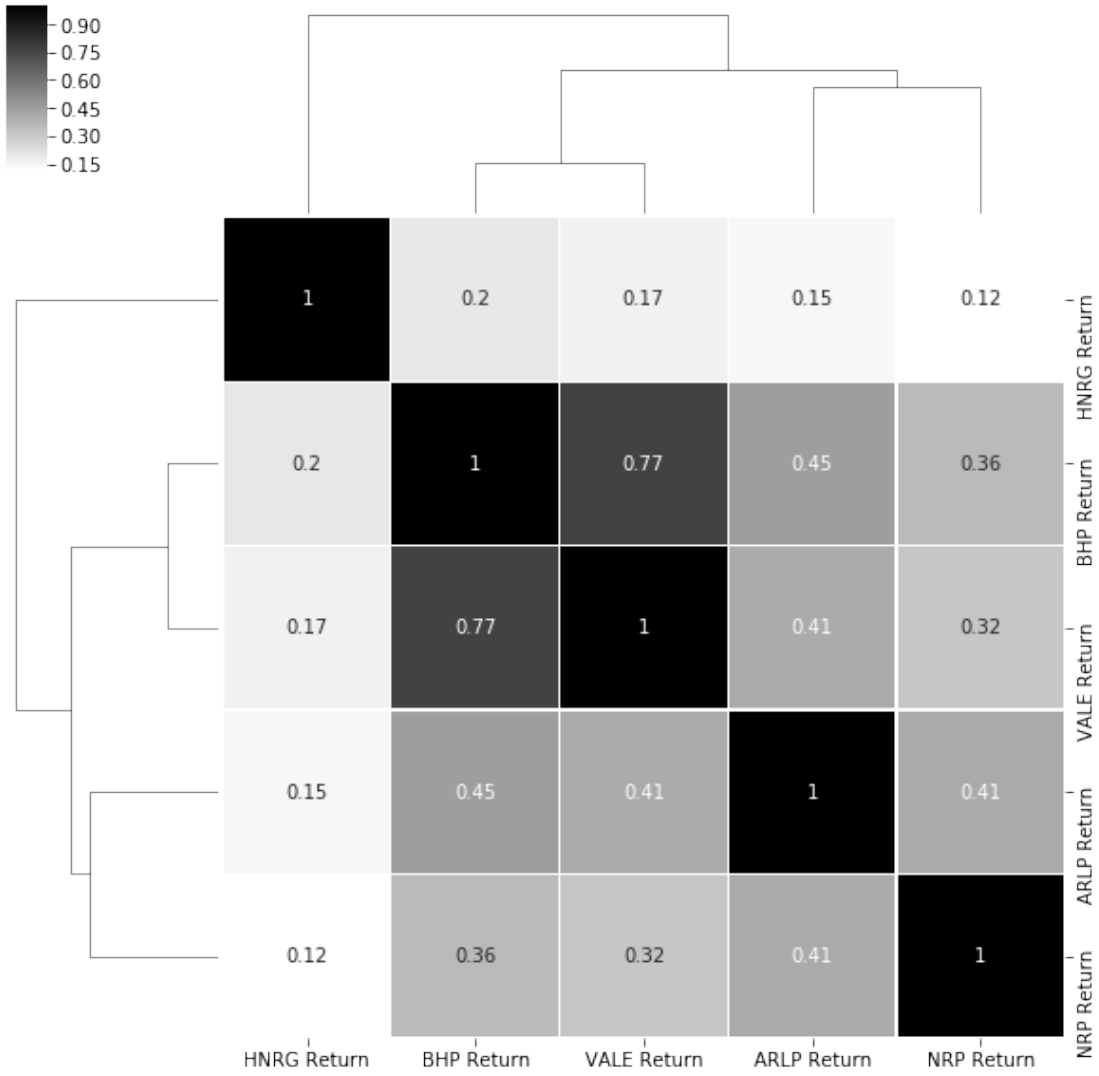
[19]:
```
returns.corr()
```

[19]:

| | BHP Return | VALE Return | HNRG Return | ARLP Return | NRP Return |
|---|---|---|---|---|---|
| BHP Return | 1.000000 | 0.769707 | 0.204551 | 0.453723 | 0.360402 |
| VALE Return | 0.769707 | 1.000000 | 0.170955 | 0.411494 | 0.318613 |
| HNRG Return | 0.204551 | 0.170955 | 1.000000 | 0.149231 | 0.119803 |
| ARLP Return | 0.453723 | 0.411494 | 0.149231 | 1.000000 | 0.413899 |
| NRP Return | 0.360402 | 0.318613 | 0.119803 | 0.413899 | 1.000000 |

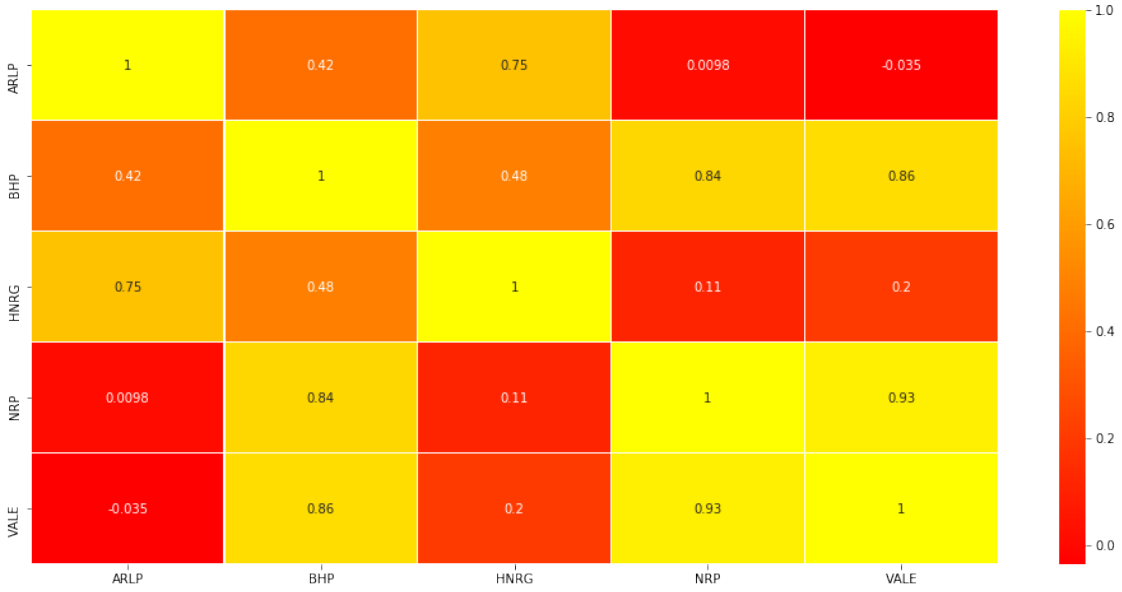
[20]:
```
# Heatmap for return of all the stocks
plt.figure(figsize=(15,10))
sns.heatmap(returns.corr(), cmap="Blues",linewidths=.1, annot= True)


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

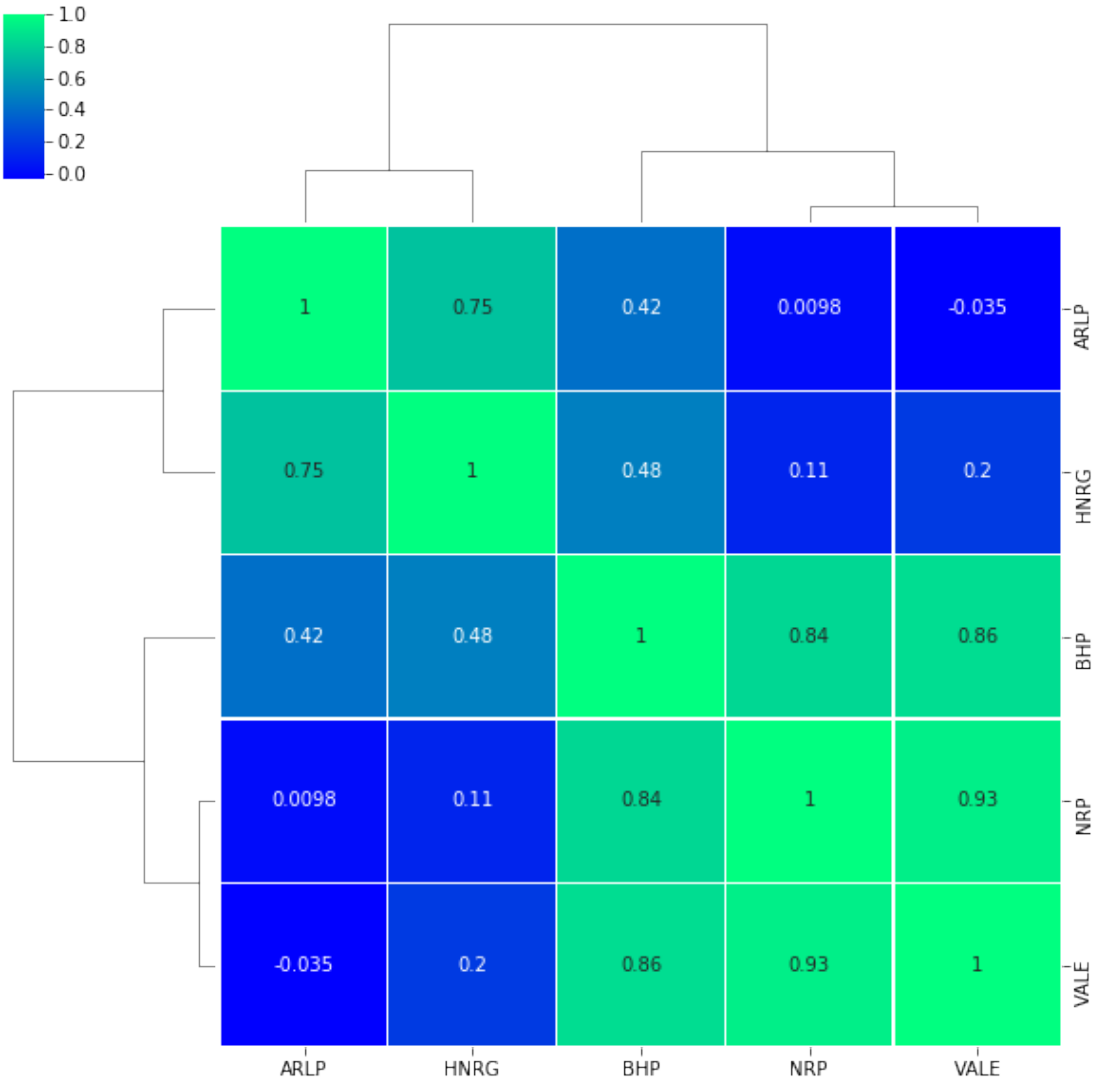
[20]:
```
<seaborn.matrix.ClusterGrid at 0x221aae8f748>
```




[21]:
```
# heatmap for Adj. Close prices for all the stock
plt.figure(figsize = (17,8))
sns.heatmap(df.corr(), cmap="autumn",linewidths=.1, annot= True)

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

[21]: <seaborn.matrix.ClusterGrid at 0x221ab5f49e8>


ARLP
BHP
HNRG
NRP
VALE
1
0.42
0.75
0.0098
-0.035
0.42
1
0.48
0.84
0.86
0.75
0.48
1
0.11
0.2
0.0098
0.84
0.11
1
0.93
-0.035
0.86
0.2
0.93
1
ARLP
BHP
HNRG
NRP
VALE
1.0
0.8
0.6
0.4
0.2
0.0


1.0
0.8
0.6
0.4
0.2
0.0
1
0.75
0.42
0.0098
-0.035
0.75
1
0.48
0.11
0.2
0.42
0.48
1
0.84
0.86
0.0098
0.11
0.84
1
0.93
-0.035
0.2
0.86
0.93
1
ARLP
HNRG
BHP
NRP
VALE
ARLP
HNRG
BHP
NRP
VALE