Homework 3 AR

January 25, 2024

[1]:
```
import yfinance as yf
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

1 1.) Clean the Apple Data to get a quarterly series of EPS.

[2]:
```
y = pd.read_csv("AAPL_quarterly_financials.csv")
```

[3]:
```
y.index = y.name
```

[4]:
```
y = pd.DataFrame(y.loc["BasicEPS", :]).iloc[2:,:]
```

[5]:
```
y.index = pd.to_datetime(y.index)
```

[6]:
```
# CHECK IF NAS ARE NO DIVIDEND PERIOD
y = y.sort_index().fillna(0.)
```

2 2.) Come up with 6 search terms you think could nowcast earnings. (Different than the ones I used) Add in 3 terms that that you think will not Nowcast earnings. Pull in the gtrends data

[7]:
```
from pytrends.request import TrendReq
```

[8]:
```
# Create pytrends object
pytrends = TrendReq(hl='en-US', tz=360)

# Set up the keywords and the timeframe
keywords = ["Discount", "Technology", "Apple Stock", "Apple Fan", "Phone␣
 ↪Reviews", "iPhone Expensive", "iPhone Tech", "NBA Match", "DMV", "Donald␣
 ↪Trump"]  # Add your keywords here
start_date = '2004-01-01'
end_date = '2024-01-01'

# Create an empty DataFrame to store the results
```

```
df = pd.DataFrame()

# Iterate through keywords and fetch data
for keyword in keywords:
    pytrends.build_payload([keyword], cat=0, timeframe=f'{start_date}␣
 ↪{end_date}', geo='', gprop='')
    interest_over_time_df = pytrends.interest_over_time()
    df[keyword] = interest_over_time_df[keyword]
```

[9]:
```
X = df = df.resample("Q").mean()
```

[10]:
```
# ALIGN DATA
temp = pd.concat([y, X],axis = 1).dropna()
y = temp[["BasicEPS"]].copy()
X = temp.iloc[:,1:].copy()
```

[11]:
```
X
```

[11]:

	Discount	Technology	Apple Stock	Apple Fan	Phone Reviews	\
2004-03-31	90.666667	96.666667	1.666667	52.333333	86.333333	
2004-06-30	91.333333	91.333333	1.000000	40.333333	83.666667	
2004-09-30	91.000000	84.000000	1.333333	59.000000	95.333333	
2004-12-31	87.666667	78.666667	2.666667	42.333333	92.333333	
2005-03-31	79.666667	78.000000	5.333333	76.333333	83.333333	
…	…	…	…	…	…	
2022-09-30	46.333333	31.000000	29.333333	66.000000	22.333333	
2022-12-31	48.000000	28.666667	27.666667	54.333333	19.333333	
2023-03-31	43.333333	30.333333	32.666667	52.666667	20.000000	
2023-06-30	43.333333	29.000000	28.000000	56.666667	20.333333	
2023-09-30	47.000000	30.333333	28.333333	62.666667	21.333333	

	iPhone Expensive	iPhone Tech	NBA Match	DMV	Donald Trump
2004-03-31	0.000000	0.000000	5.333333	75.666667	2.333333
2004-06-30	2.333333	1.000000	8.666667	86.333333	2.000000
2004-09-30	2.333333	0.000000	3.666667	94.666667	1.333333
2004-12-31	3.000000	2.000000	11.333333	67.666667	2.000000
2005-03-31	0.000000	0.000000	10.000000	71.333333	2.000000
…	…	…	…	…	…
2022-09-30	55.666667	40.666667	13.666667	44.000000	4.000000
2022-12-31	49.000000	41.000000	55.333333	36.000000	4.000000
2023-03-31	47.000000	34.333333	65.333333	40.666667	3.666667
2023-06-30	47.666667	30.666667	76.000000	41.666667	4.666667
2023-09-30	56.666667	37.333333	16.333333	41.333333	5.000000

[79 rows x 10 columns]

3 3.) Normalize all the X data

[12]:
```
from sklearn.preprocessing import StandardScaler
```

[13]:
```
scaler = StandardScaler()
```

[14]:
```
X_scaled=scaler.fit_transform(X)
```

4 4.) Run a Lasso with lambda of .5. Plot a bar chart.

[24]:
```
from sklearn.linear_model import Lasso
```

[25]:
```
lasso=Lasso(alpha=.5)
```

[46]:
```
lasso.fit(X, y)
```

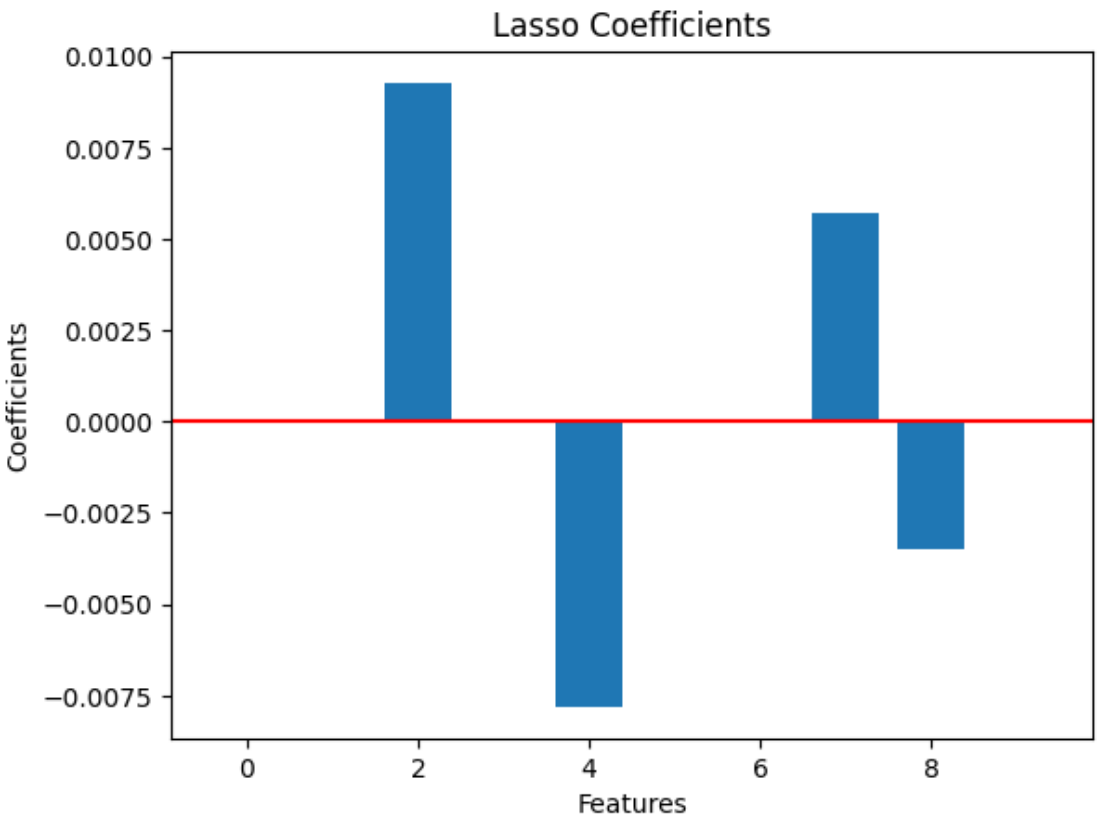
[46]:
```
Lasso(alpha=0.5)
```

[47]:
```
coefficients = lasso.coef_
```

[48]:
```
coefficients
```

[48]:
```
array([ 0.        ,  0.        ,  0.00927675,  0.        , -0.00781184,
        0.        , -0.        ,  0.00571319, -0.0034969 , -0.        ])
```

[51]:
```
plt.bar(range(X_scaled.shape[1]), coefficients)
plt.axhline(0, color = "red")
plt.xlabel('Features')
plt.ylabel('Coefficients')
plt.title('Lasso Coefficients')
plt.show()
```



5 5.) Do these coefficient magnitudes make sense?

[ ]: