Assignment3

January 26, 2024

```
[1]: import pandas as pd
     import matplotlib.pyplot as plt
```

1   0.) 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]: y = y.fillna(0.).sort_index()
```

2   2.) Normalize all the X data

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

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

     # Set up the keywords and the timeframe
     keywords = ["MacBook","iPhone","iPad","Apple Layoffs","Sales","Apple Share␣
       ↪Price",
                 "Recession","Policy","Taylor Swift Tickets","Is the Earth␣
       ↪Flat","Hospital"]  # 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:
```

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        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]
```

```
[10]: X = df.resample("Q").mean()
      temp = pd.concat([y,X],axis=1).dropna()
      y = temp[["BasicEPS"]].copy()
      X = temp.iloc[:,1:].copy()
```

```
[11]: from sklearn.preprocessing import StandardScaler
      scaler = StandardScaler()
      X_scaled = scaler.fit_transform(X)
```

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

```
[12]: from sklearn.linear_model import Lasso
      lasso = Lasso(alpha = .1)
      lasso.fit(X_scaled,y)
      coefficients = lasso.coef_
```

```
[13]: plt.figure(figsize = (18,5))
      plt.bar(range(len(coefficients)),coefficients,tick_label=X.columns)
      plt.axhline(0.,color = "red")
      plt.show()
```
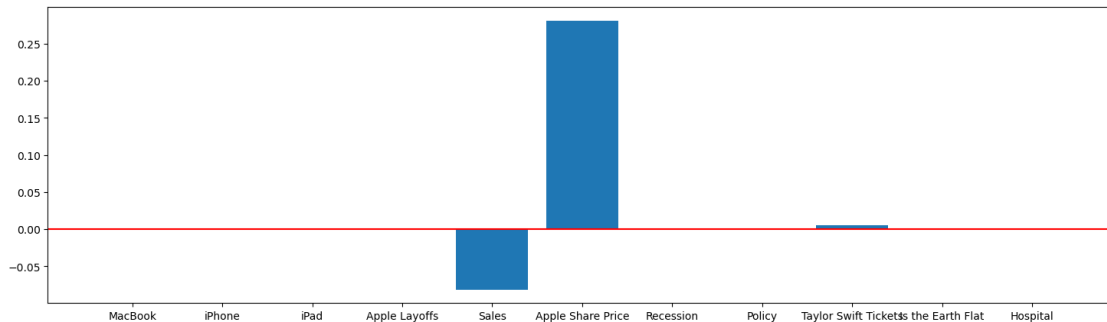

4 5.) Do these coefficient magnitudes make sense?

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5 6.) Run a for loop looking at 10 different Lambdas and plot the coefficient magnitude for each.

[ ]:

[ ]:

6 7.) Run a cross validation. What is your ideal lambda?

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