

Index Funds Case Study

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Core Message

Our project is to uncover patterns in the activity of the stocks in the S&P 500 and the Dow Jones Index.

We plan to further use these patterns to predict future activity of these indexes.

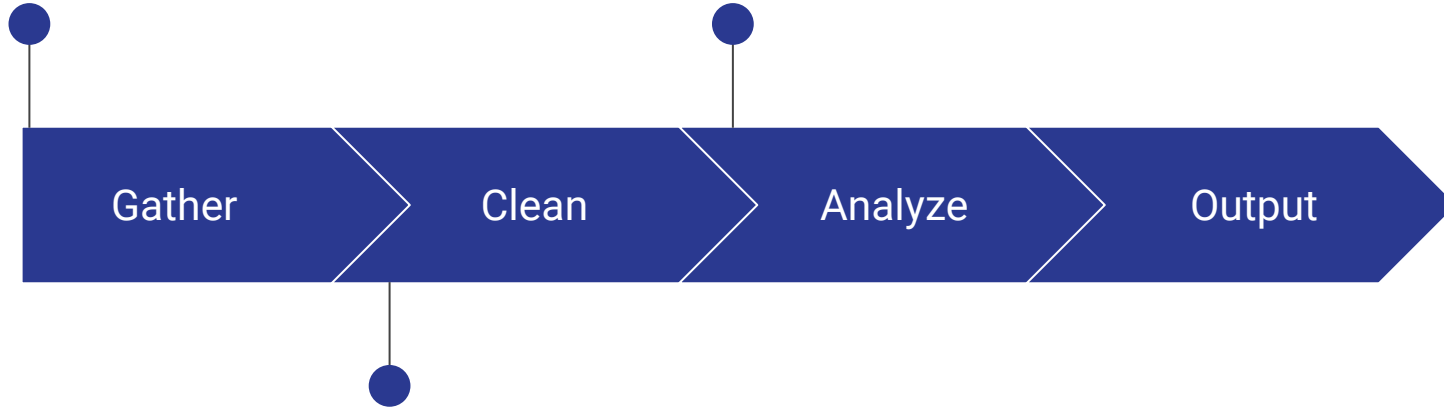
Questions

- ❖ Stock Performance
 - Month
 - Week
 - Day
- ❖ Which Sectors define the Market?
 - S&P 500
 - Dow Jones

Implementation

Create/Search for
Datasets

Analyze the Datasets
to answer the
questions



Sort the Datasets into
timeframes

Data

How did we determine our
Sample Data?

Dow Data:

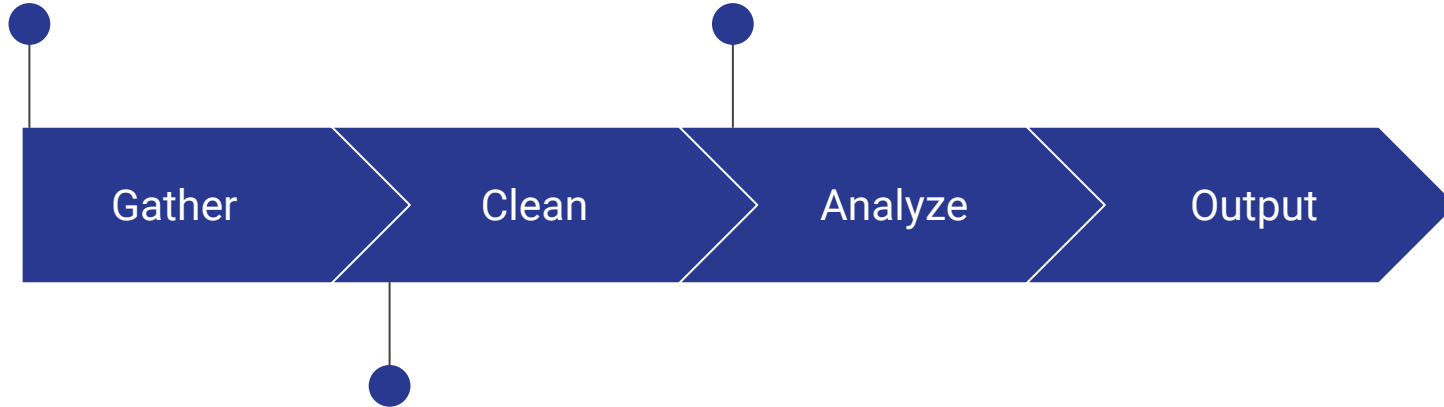
- Yahoo Finance

S&P 500 Data:

- <https://www.kaggle.com/camnugent/sandp500>

Create/Search for
Datasets

Analyze the Datasets
to answer the
questions



Sort the Datasets into
timeframes

Question 1: Stock Performance

Methodology

Method:

- 1) Daily Change
 - a) Daily Change column in the dataframe
- 2) Weekly Change
 - a) Parsed the daily stock data into week intervals
 - i) `Pd.to_datetime(stocks_df['Date'])`
 - ii) `stocks_df['Date'].dt.week`
- 3) Monthly Change



	Date	Open	High	Low	Close	Volume	Symbol	Stock Name	Industry	Sector	Daily Change
0	1/2/15	111.389999	111.440002	107.349998	109.330002	53204600	AAPL	Apple Inc.	Consumer Electronics	Technology	-0.018494
1	1/5/15	108.290001	108.650002	105.410004	106.250000	64285500	AAPL	Apple Inc.	Consumer Electronics	Technology	-0.018838
2	1/6/15	106.540001	107.430000	104.629997	106.260002	65797100	AAPL	Apple Inc.	Consumer Electronics	Technology	-0.002628
3	1/7/15	107.199997	108.199997	106.699997	107.750000	40105900	AAPL	Apple Inc.	Consumer Electronics	Technology	0.005131
4	1/8/15	109.230003	112.150002	108.699997	111.889999	59364500	AAPL	Apple Inc.	Consumer Electronics	Technology	0.024352
...
36448	12/23/19	58.709999	59.000000	58.419998	58.570000	4813200	WBA	Walgreens Boots Alliance, Inc	Pharmaceutical Retailers	Healthcare	-0.002385
36449	12/24/19	58.900002	58.919998	58.279999	58.349998	1475400	WBA	Walgreens Boots Alliance, Inc	Pharmaceutical Retailers	Healthcare	-0.009338
36450	12/26/19	58.340000	59.020000	58.299999	58.900002	2736100	WBA	Walgreens Boots Alliance, Inc	Pharmaceutical Retailers	Healthcare	0.009599
36451	12/27/19	58.919998	59.029999	58.380001	59.020000	3647600	WBA	Walgreens Boots Alliance, Inc	Pharmaceutical Retailers	Healthcare	0.001697
36452	12/30/19	59.090000	59.599998	58.810001	58.910000	3264500	WBA	Walgreens Boots Alliance, Inc	Pharmaceutical Retailers	Healthcare	-0.003046

Methodology

Method:

1) Daily Change

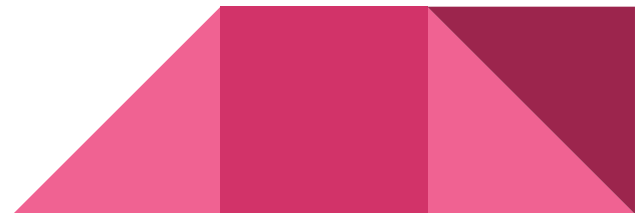
- a) Daily Change column in the dataframe

2) Weekly Change

- a) Parsed the daily stock data into week intervals
 - i) `Pd.to_datetime(stocks_df['Date'])`
 - ii) `stocks_df['Date'].dt.week`

3) Monthly Change

- a) `pd.DataFrame({'year': stocks_month['Year'], 'month': stocks_month['Month Number'], 'day':[1 for x in range(480)]})`
- b) `stocks_month['Year-Month']= pd.to_datetime(year_month_df)`



	Sector	Year	Month Number	Monthly Change	Year-Month
0	Communication Services	2015	1	-0.034533	2015-01-01
1	Communication Services	2015	2	0.105162	2015-02-01
2	Communication Services	2015	3	-0.002400	2015-03-01
3	Communication Services	2015	4	0.036139	2015-04-01
4	Communication Services	2015	5	-0.010996	2015-05-01
...
475	Technology	2019	8	-0.066182	2019-08-01
476	Technology	2019	9	0.066855	2019-09-01
477	Technology	2019	10	0.019000	2019-10-01
478	Technology	2019	11	0.024960	2019-11-01
479	Technology	2019	12	0.037319	2019-12-01

S&P 500

Daily

**Church & Dwight:
05/19/2014**

Symbol: CHD

Open: 18.77

Close: 33.895

% Change: +80.58%

Weekly

**Skyworks Solutions:
12/30/2013-01/03/14**

Symbol: SWKS

Open: 28.3

Close: 72.71

% Change: +156.93%

Monthly

**Chesapeake Energy:
April 2016**

Symbol: CHK

Open: 3.98

Close: 6.87

% Change: +72.6%

Dow Jones Index

Daily

Merck & Co:
02/06/2018

Symbol: MRK

Open: 57.84

Close: 63.86

% Change: +10.40%

Weekly

Apple:
12/31/18-1/4/19

Symbol: AAPL

Open: 154.89

Close: 291.52

% Change: +88.211%

Monthly

Disney:
April 2019

Symbol: DIS

Open: 111.59

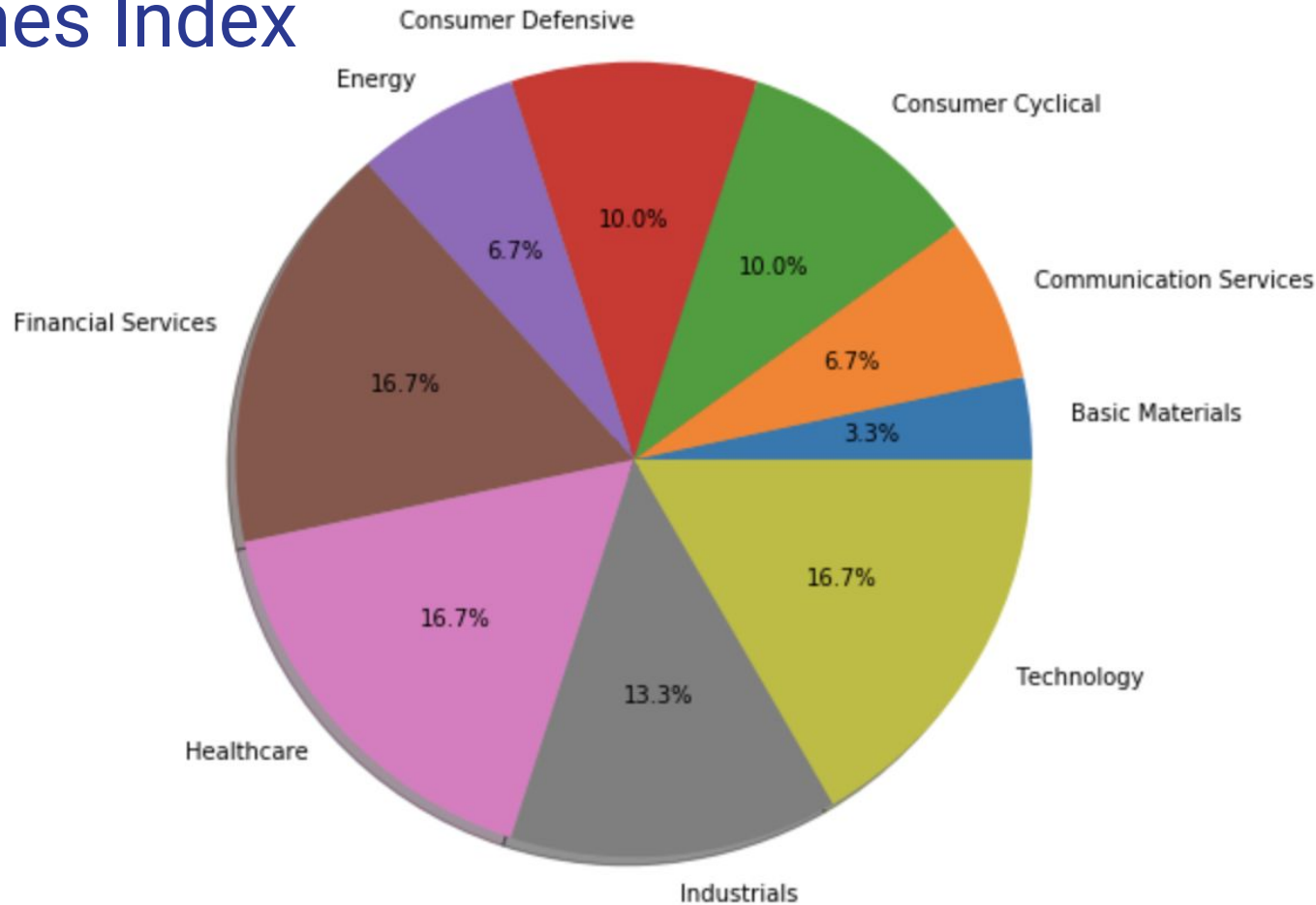
Close: 136.97

% Change: +22.7%



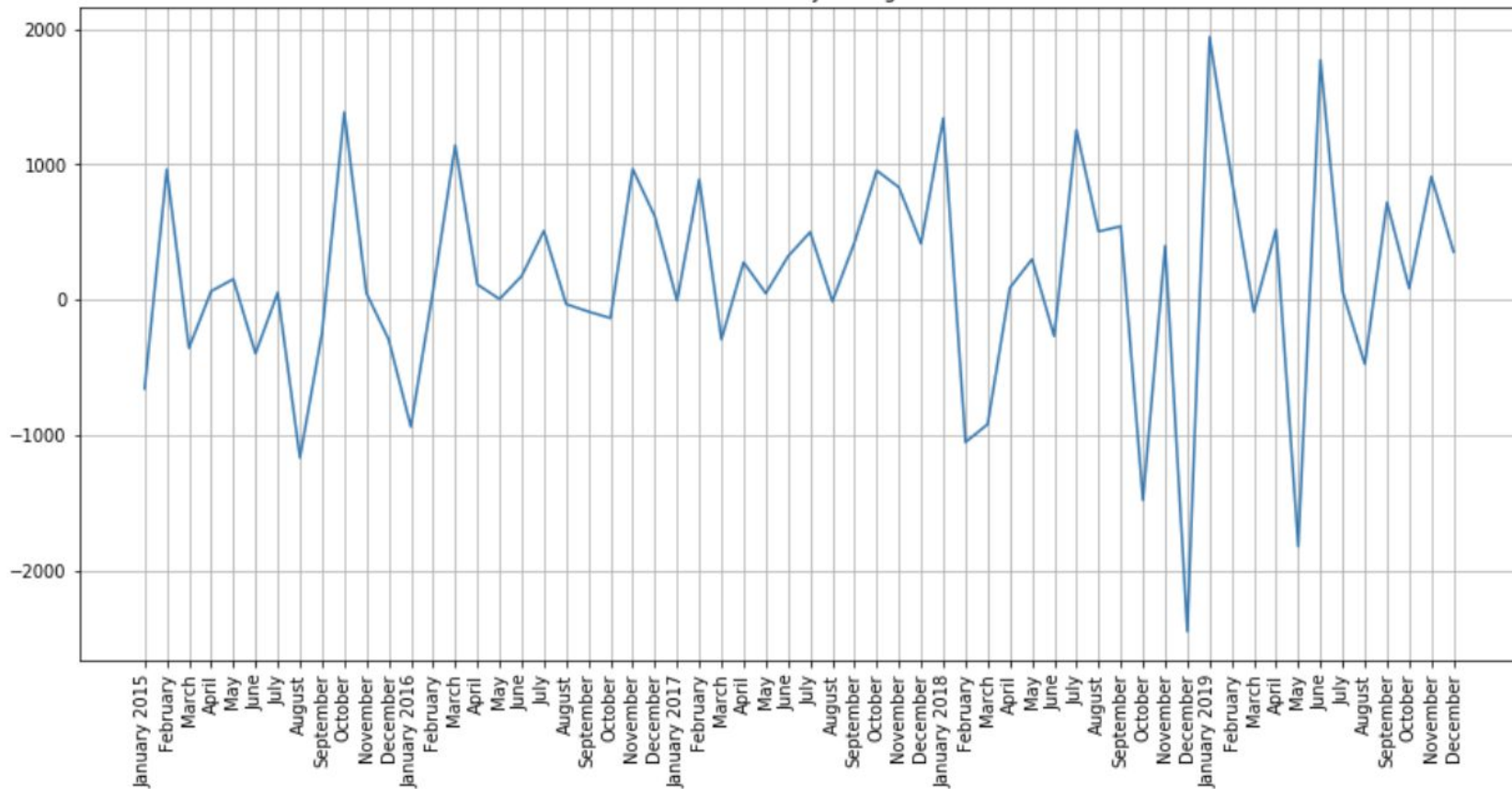
Question 2: Which Sectors define the Index Funds?

Dow Jones Index



DOW JONES

Dow Monthly Change



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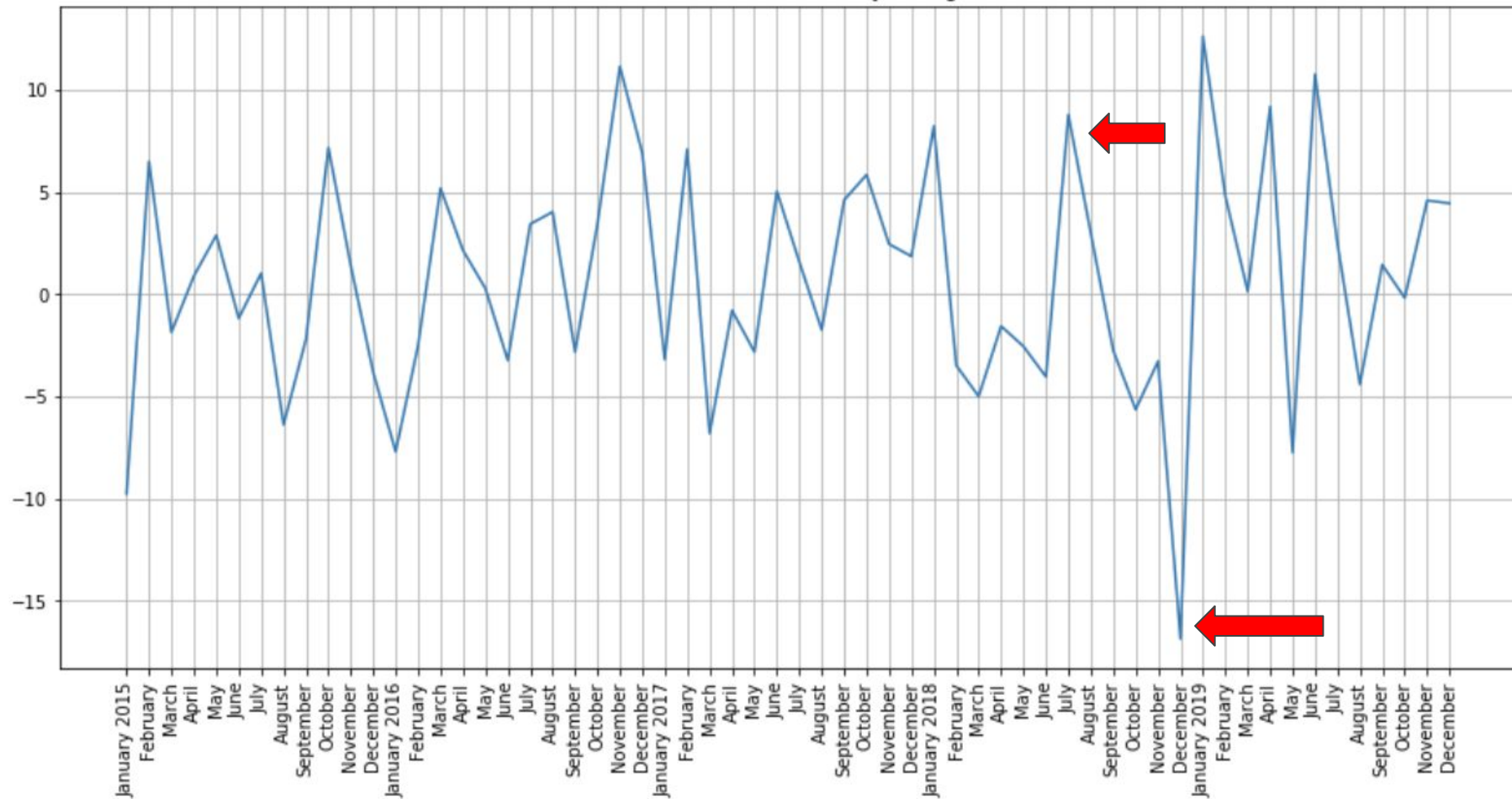
Dow Jones Correlation

<u>SECTOR</u>	<u>R-Value</u>
Healthcare	0.638121
Technology	0.794922
Financial Services	0.874308
Industrials	0.852058
Consumer Defensive	0.435784
Consumer Cyclical	0.713978
Communication Services	0.593464
Energy	0.710945

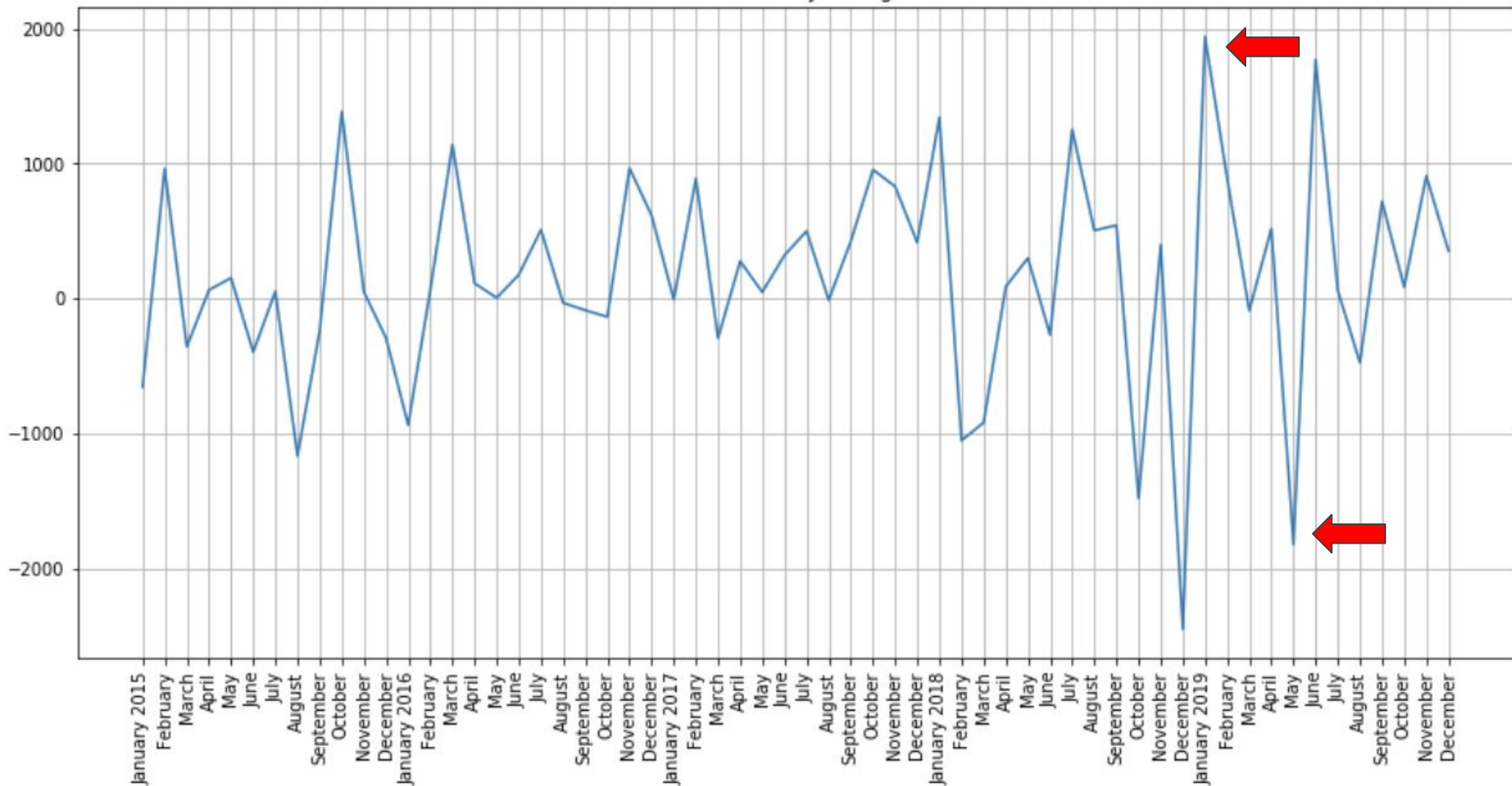
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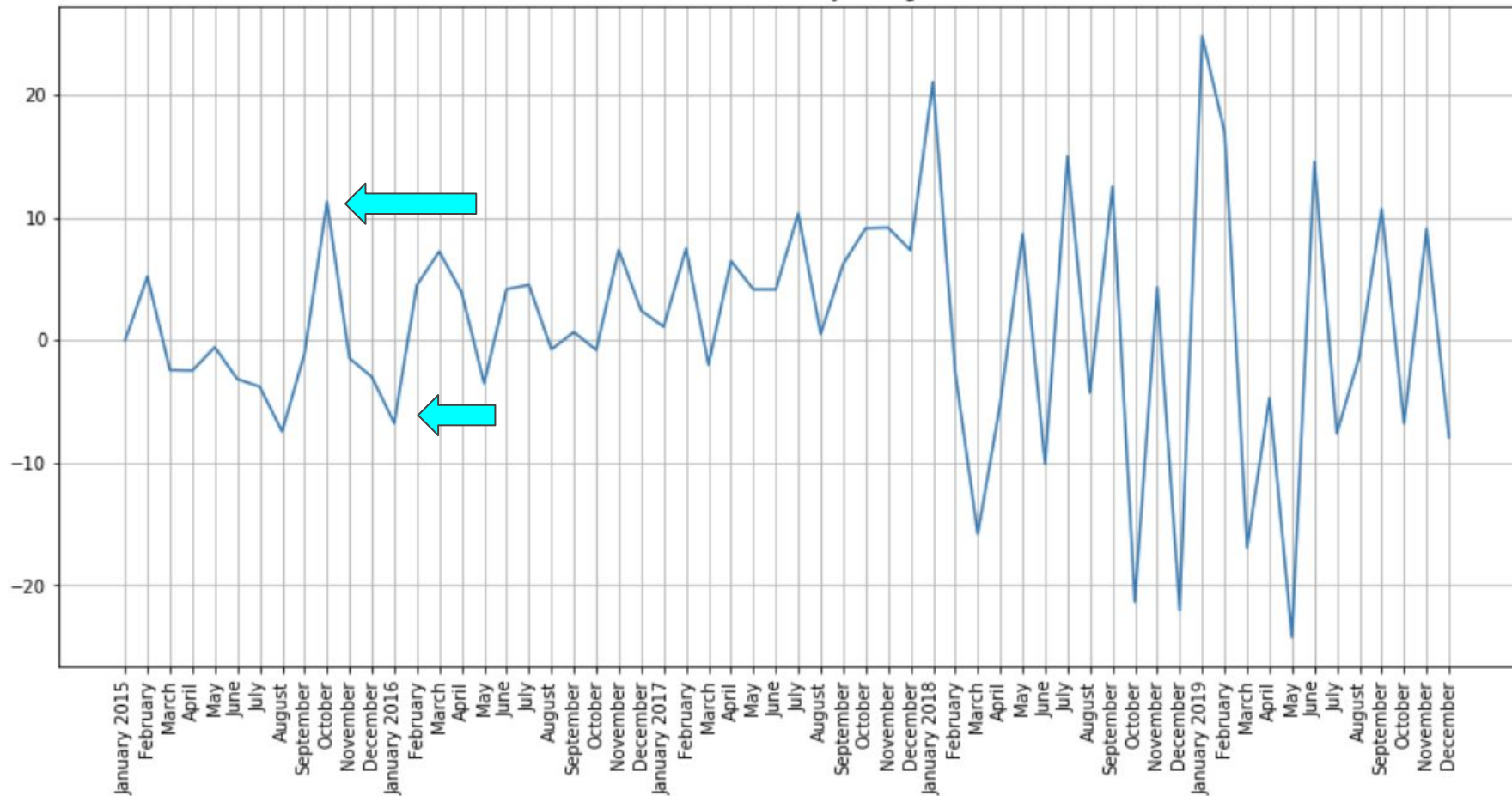
Financial Services Monthly Change



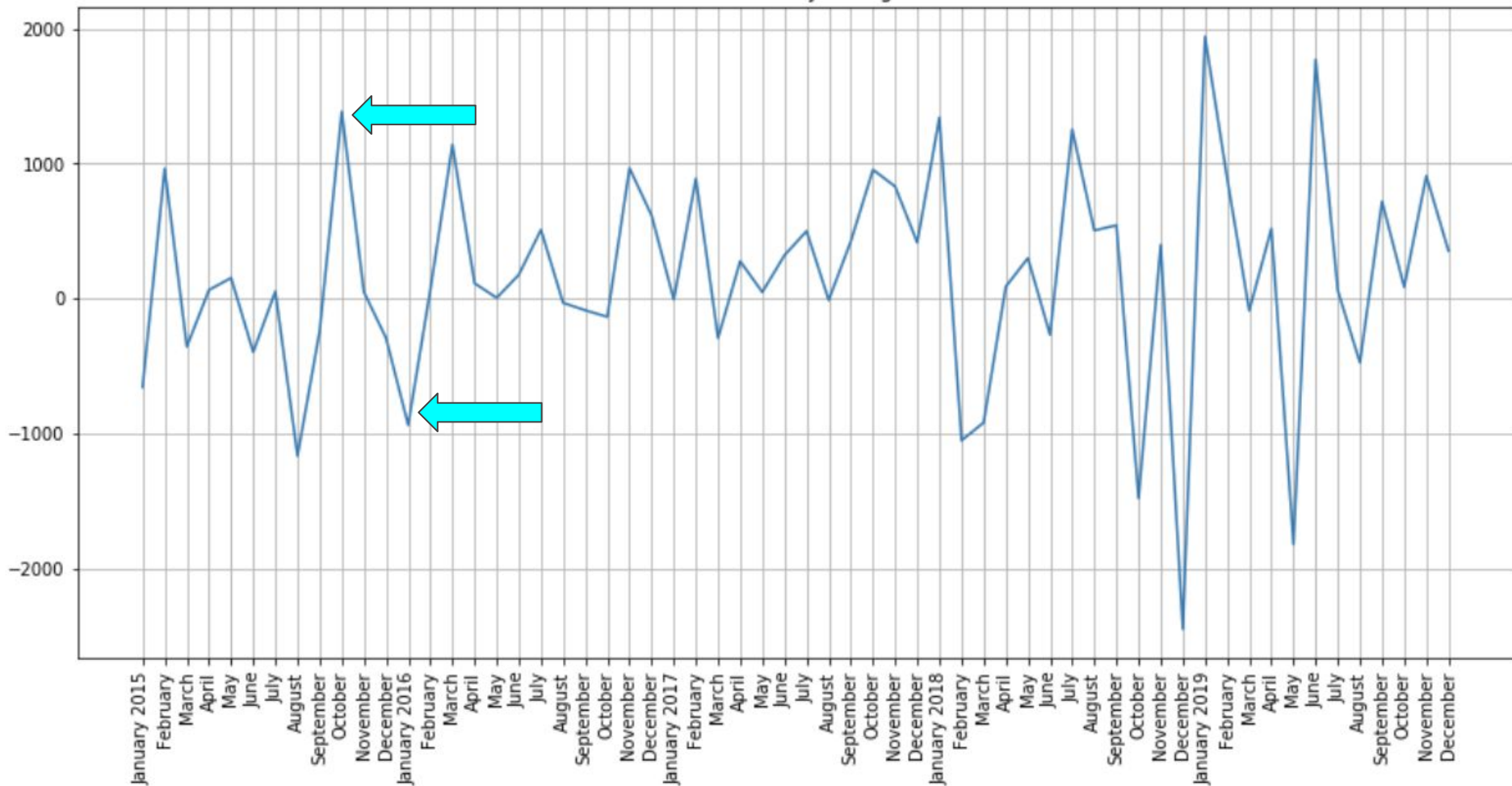
Dow Monthly Change



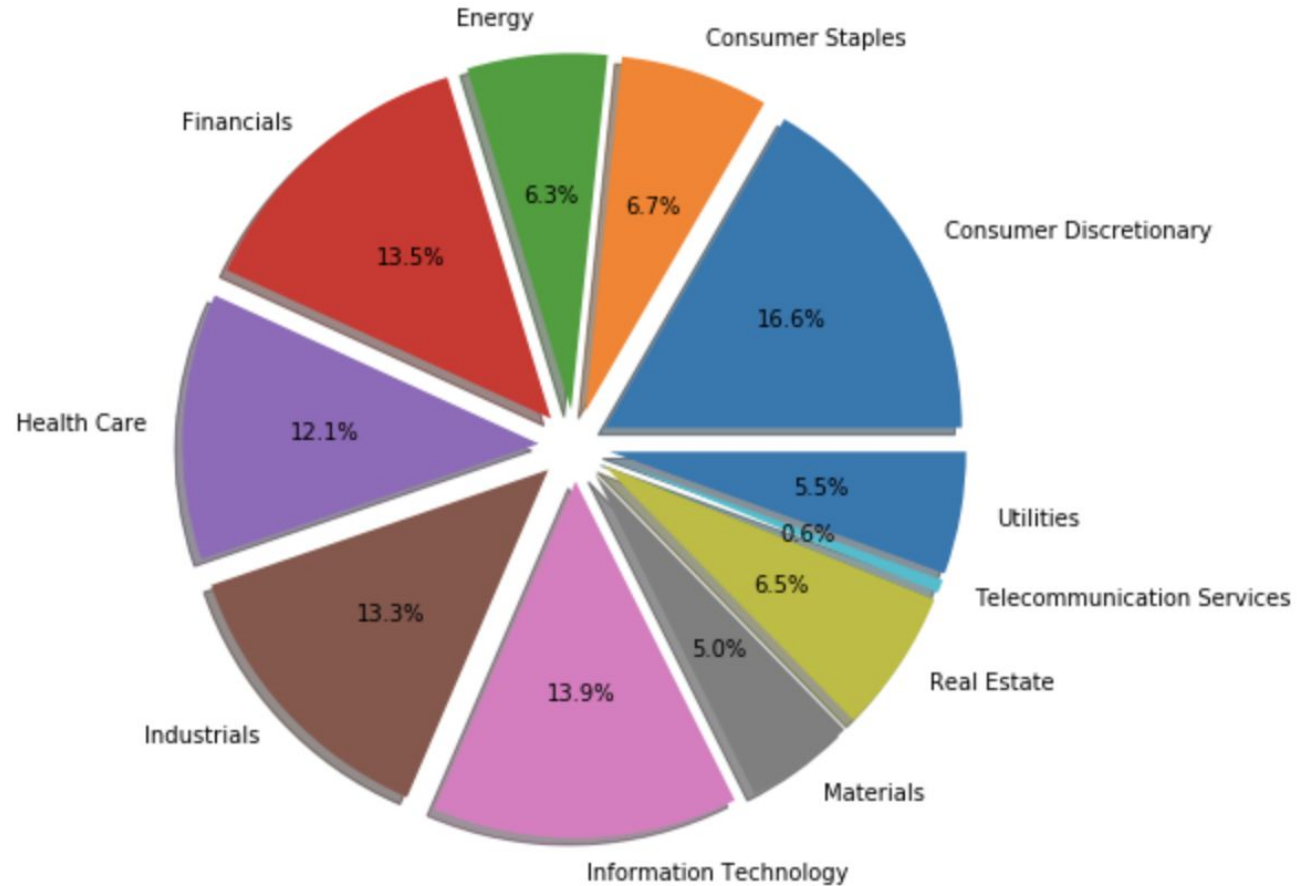
Industrials Monthly Change



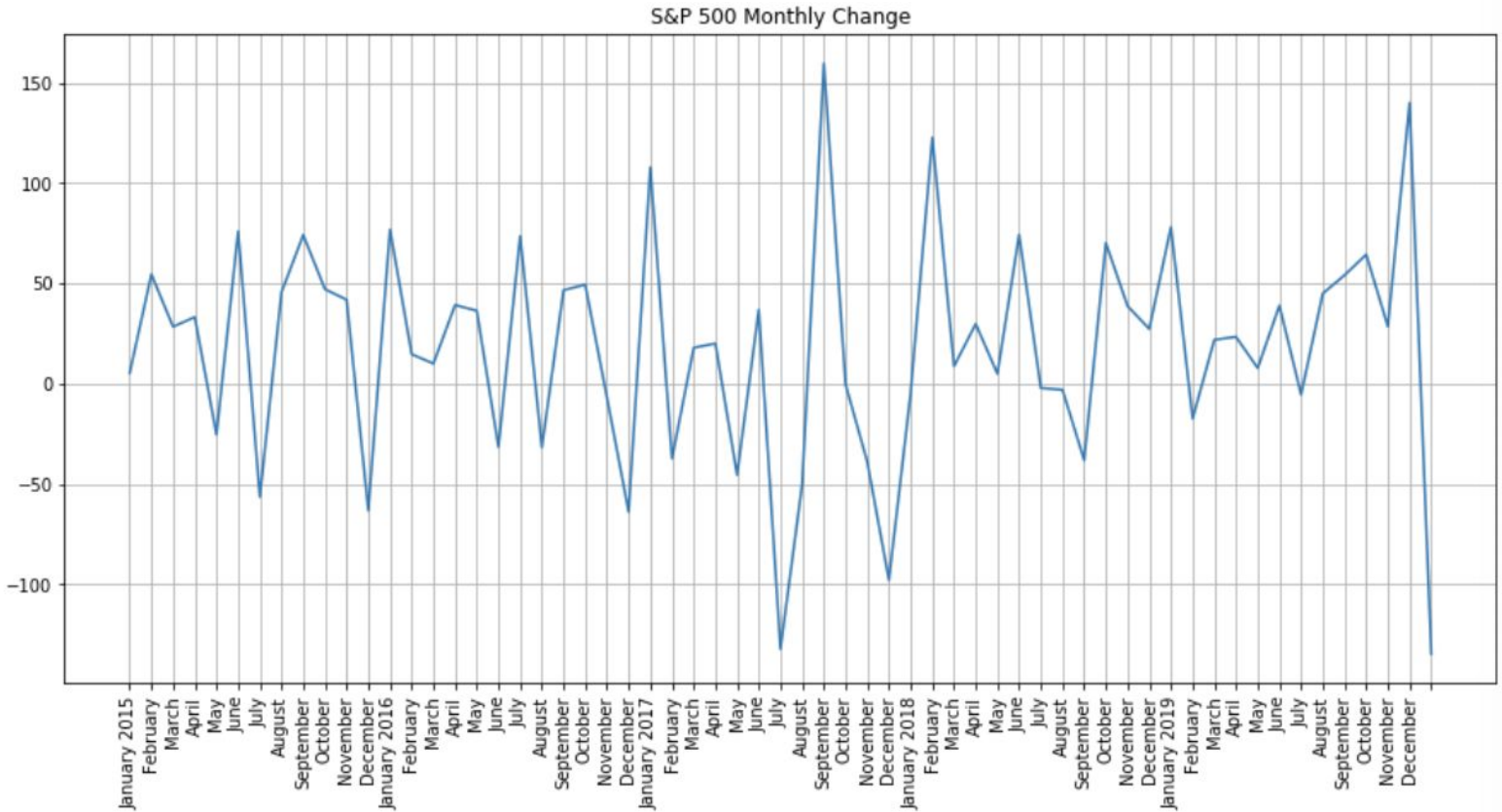
Dow Monthly Change



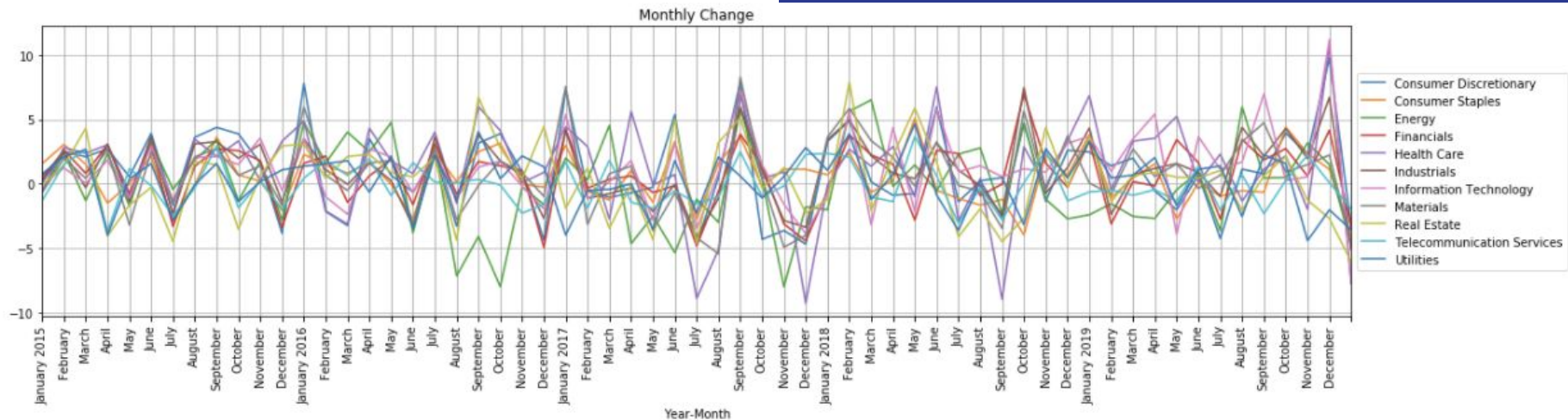
S&P 500 Index



S&P 500





S&P 500



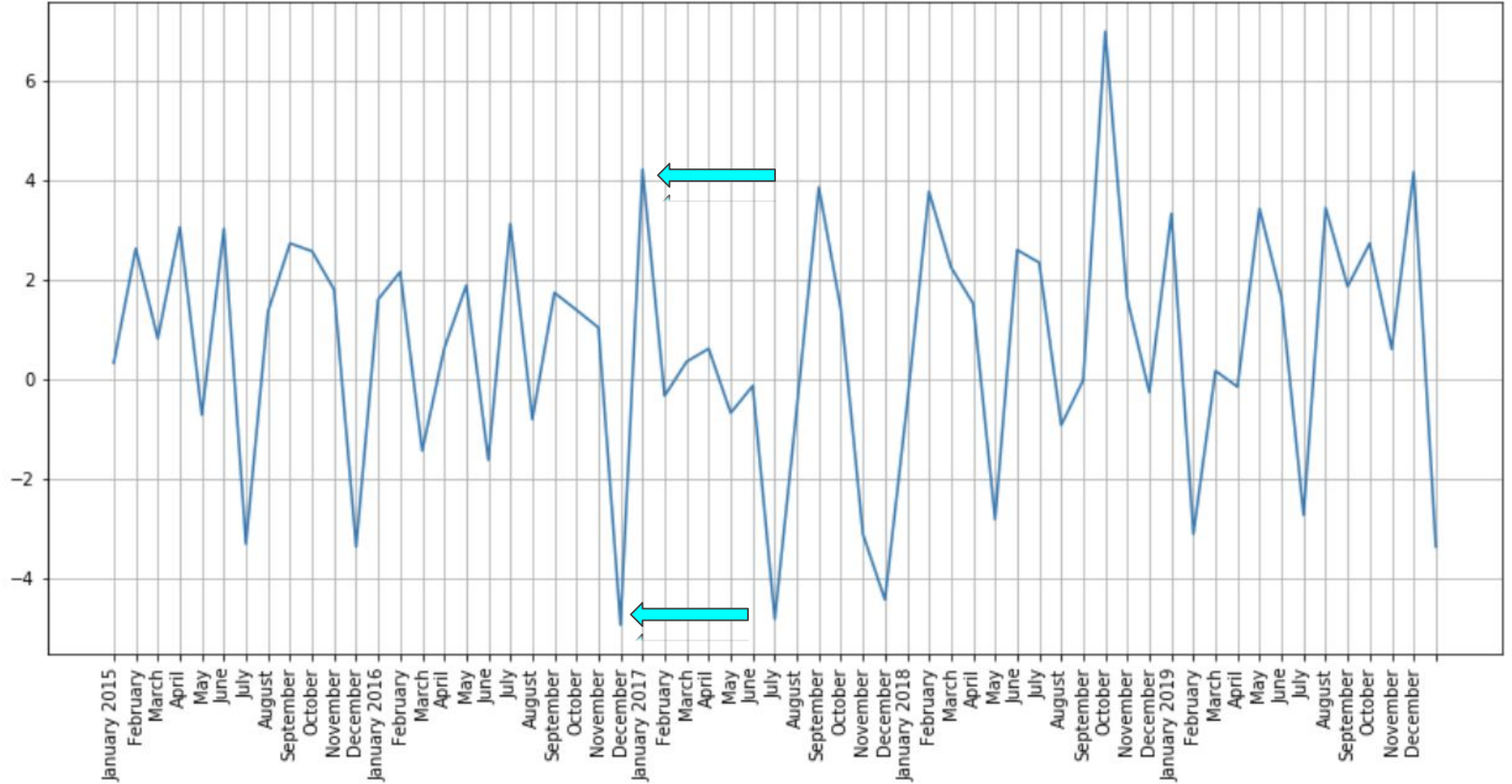
S&P 500 Correlation

<u>SECTOR</u>	<u>R-Value</u>
Consumer Discretionary	0.818871
Information Technology	0.80623
Financials	0.833391
Industrials	0.889908
Health Care	0.740477
Consumer Staples	0.558884
Real Estate	0.411288
Utilities	0.177982
Energy	0.481689
Materials	0.822294

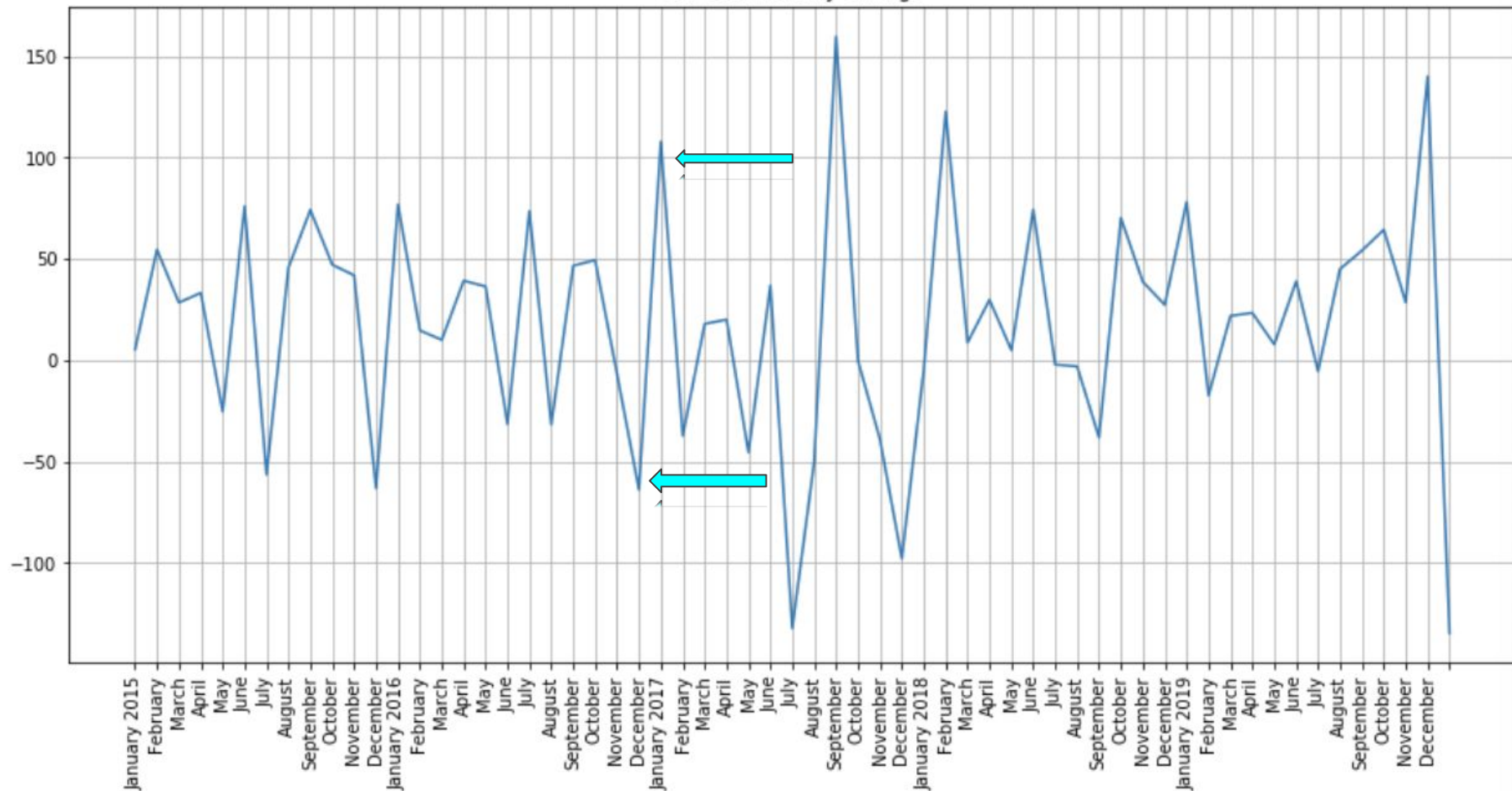
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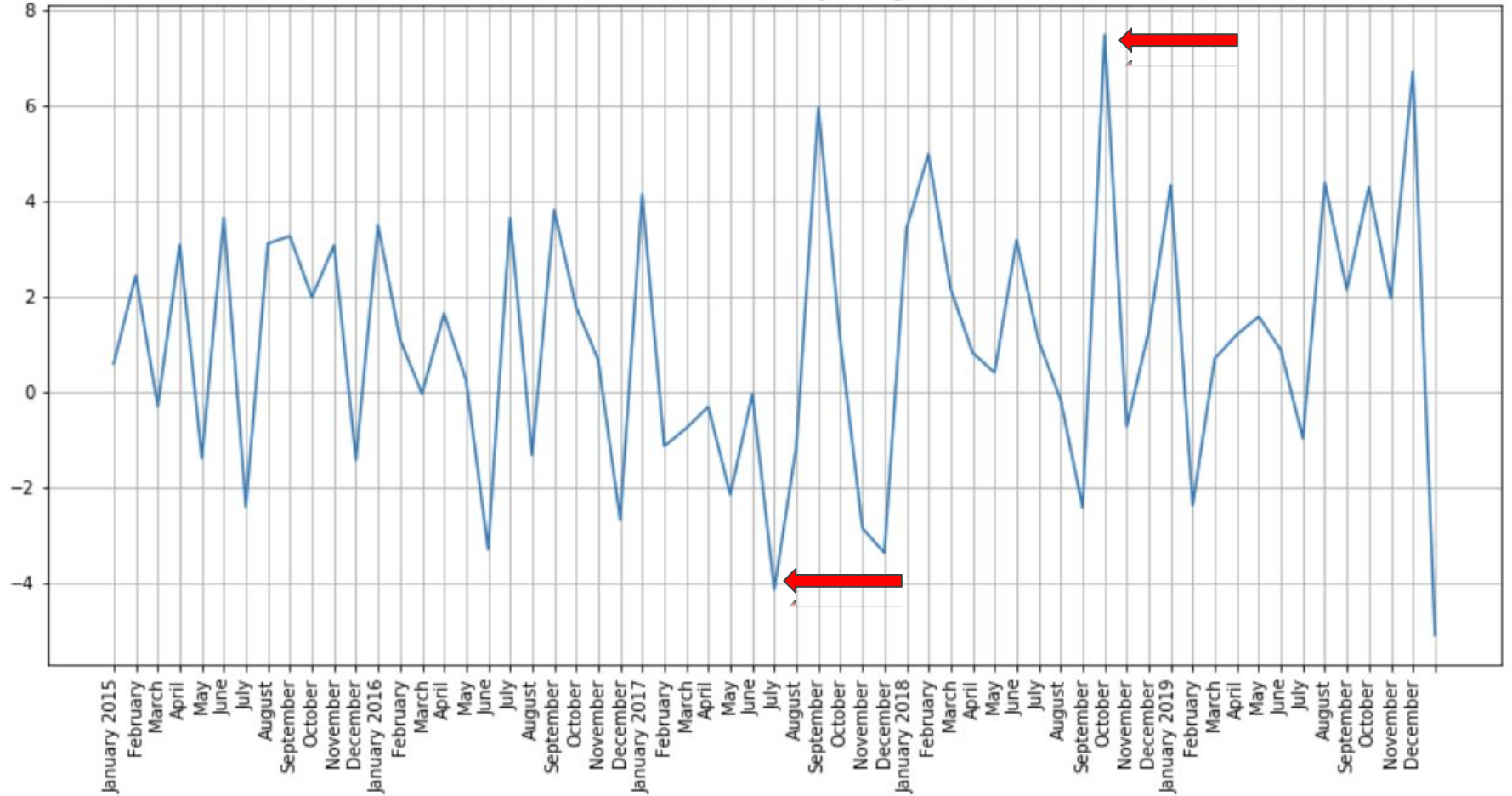
Financial Monthly Change



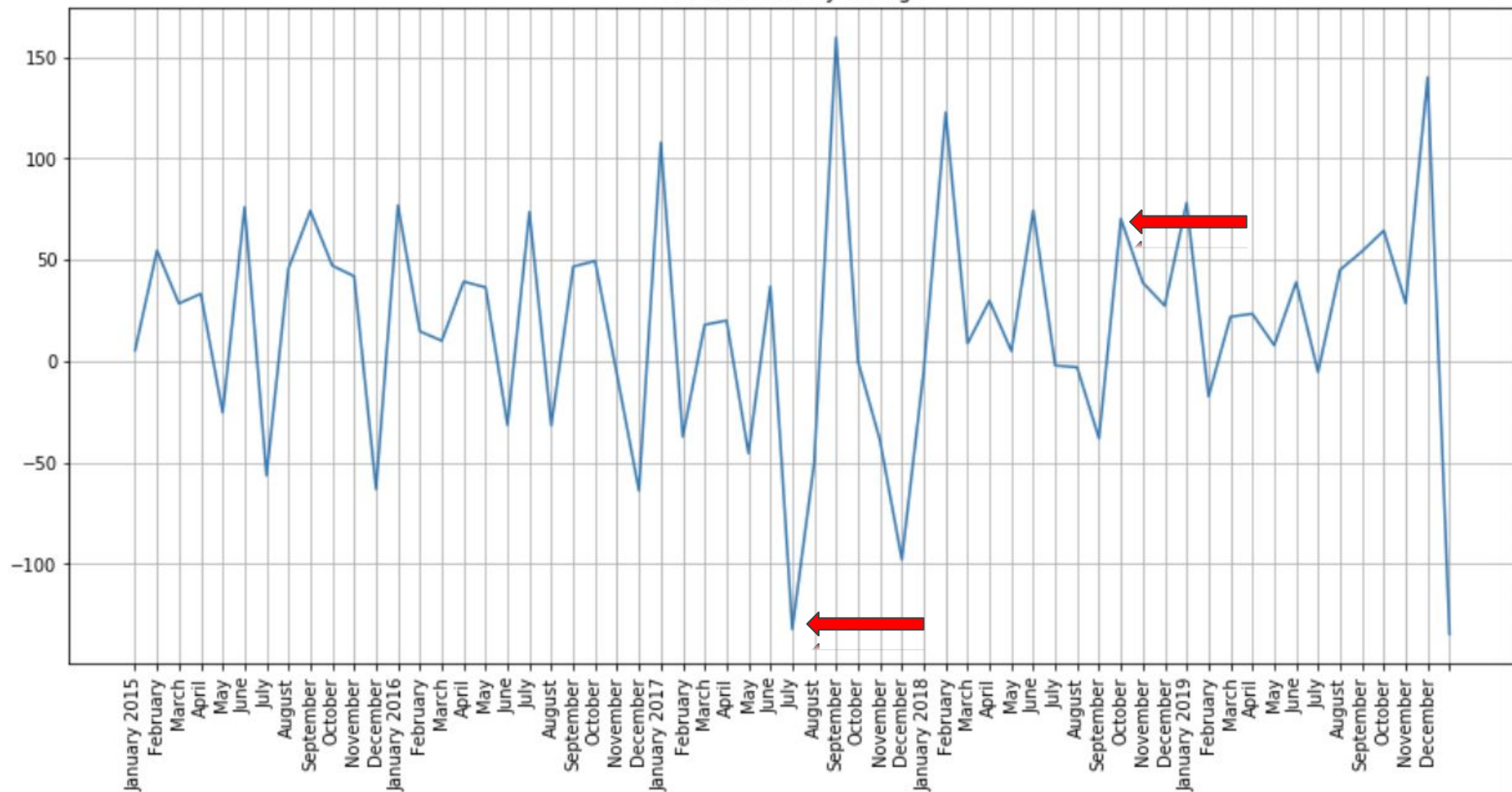
S&P 500 Monthly Change



Industrials Monthly Change



S&P 500 Monthly Change



- **Stock Performance**
 - Use the adjusted growth to predict future activity of the stocks selected.
- **Sector Correlation**
 - Will use this correlation to predict the future activity of the index funds

Impact

Questions