Financial Analysis & Prediction

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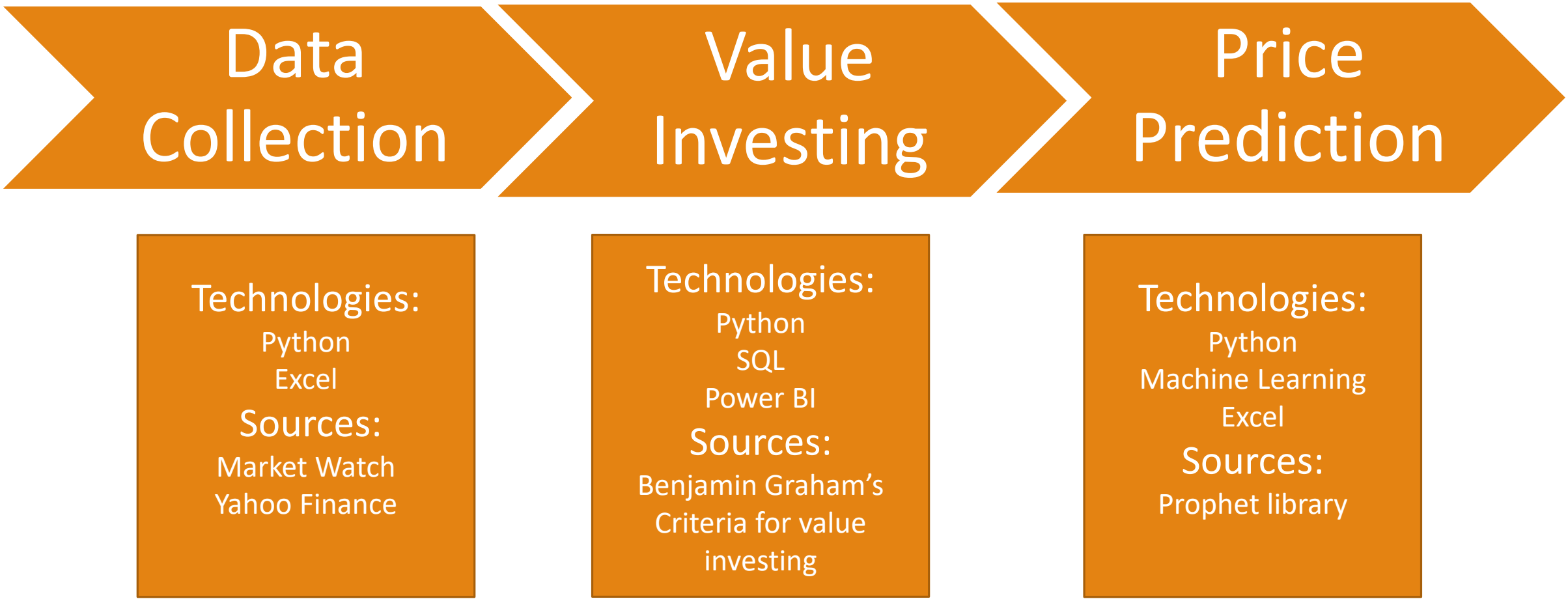
Workflow


Data Collection
Value Investing
Price Prediction
Technologies:
Python
Excel
Sources:
Market Watch
Yahoo Finance
Technologies:
Python
SQL
Power BI
Sources:
Benjamin Graham's Criteria for value investing
Technologies:
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Machine Learning
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Important Stocks Fundamentals

EPS: Earnings per share

The resulting number serves as an indicator of a company's profitability.

Eps-growth:

It gives a good picture of the rate at which a company has grown its profitability.

Net-income:

Net income is the residual amount of earnings after all expenses have been deducted from sales.

Shareholder equity:

Equity is equal to a firm's total assets minus its total liabilities.

ROE[Net income / shareholder equity]:

Because shareholders' equity is equal to a company’s assets minus its debt, ROE could be thought of as the return on net assets.

EBITDA:

Earnings before interest, tax, depreciation and amortization (EBITDA) is a measure of a company's operating performance.

Interest coverage ratio [EBITDA/ Interest Expenses]:

The interest coverage ratio measures how many times a company can cover its current interest payment with its available earnings.

Current Ratio:

Ratio of Current assets to current liabilities

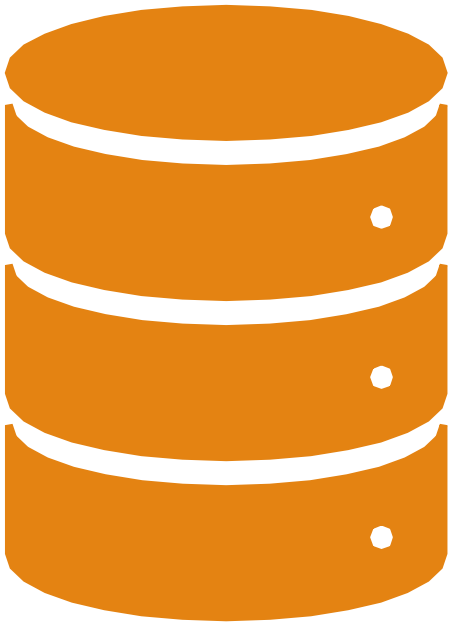
Long-term debt:

Long Term Debt is any amount of outstanding debt a company holds that has a maturity of 12 months or longer

P/B ratio:

financial ratio used to compare a company's current market price to its book value.

Data Collection



1] We carried out this analysis on 502 stocks

2] All the stock fundamentals are genuine, and web scrapped from Market Watch

3] The current and historical stock prices are obtained from Yahoo- finance

4] Dividend values are also obtained from Yahoo-finance

Python code for Web scraping Preview

Web scraping few other stocks fundamentals

In [11]:

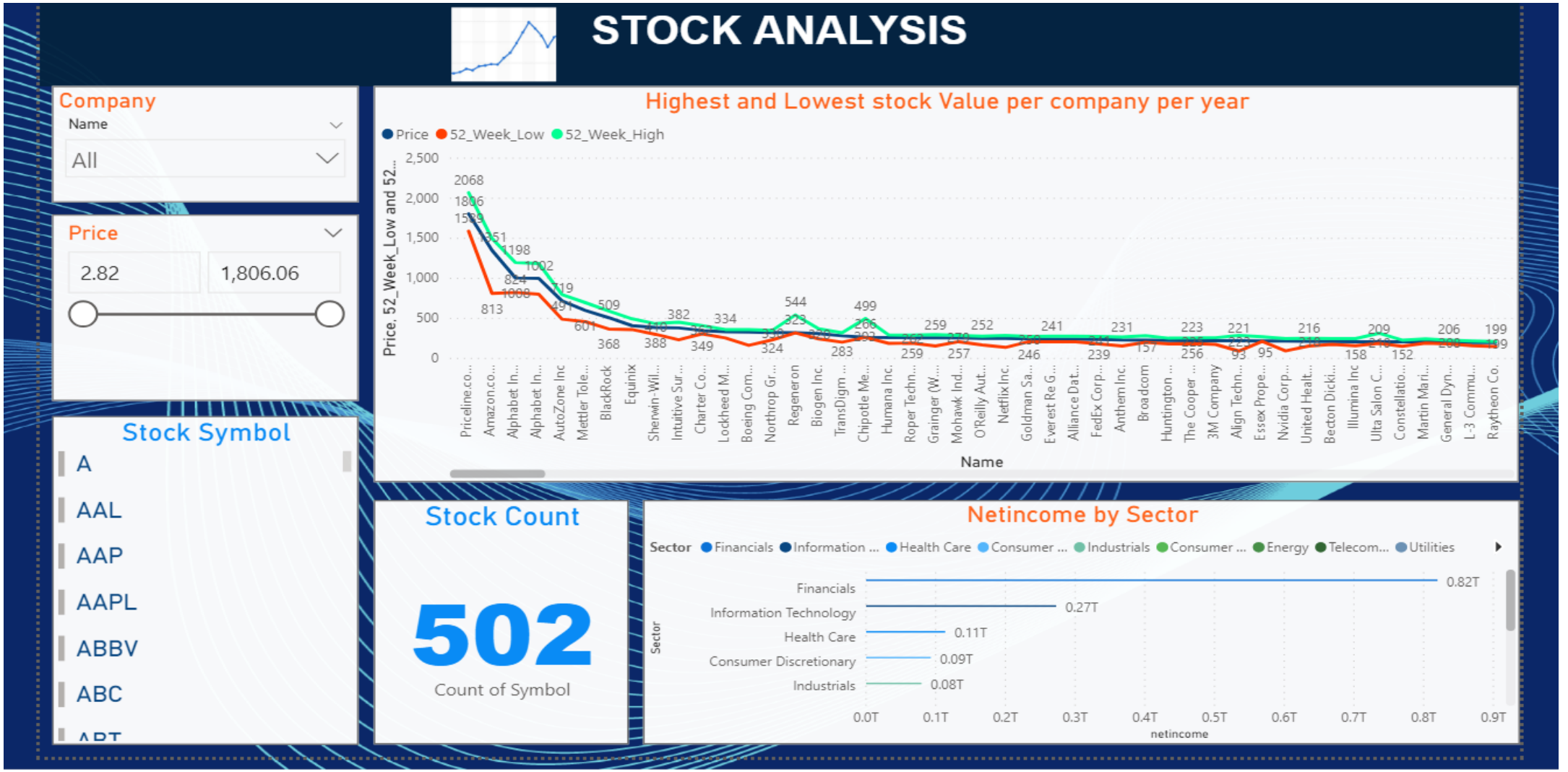
```
def getFinancialProfiledf(ticker):

    # try:
    urlprofiles = 'https://www.marketwatch.com/investing/stock/'+ticker+'/profile'
    text_soup_profiles = BeautifulSoup(requests.get(urlprofiles).text,"lxml") #read in
    titlesprofiles = text_soup_profiles.findAll('p', {'class': 'column'})
    ROE=0
    Current_Ratio=0
    PE_Ratio=0
    debt_to_equity=0
    PB_Ratio=0
    for title in titlesprofiles:
        if 'Return on Equity' in title.text:
            ROE= [p.text for p in title.findNextSiblings(attrs={'class': 'data lastcolumn'}) if p.text]
        if 'Current Ratio' in title.text:
            Current_Ratio= [p.text for p in title.findNextSiblings(attrs={'class': 'data lastcolumn'}) if p.text]
        if 'P/E Current' in title.text:
            PE_Ratio= [p.text for p in title.findNextSiblings(attrs={'class': 'data lastcolumn'}) if p.text]
        if 'Total Debt to Total Equity' in title.text:
            debt_to_equity= [p.text for p in title.findNextSiblings(attrs={'class': 'data lastcolumn'}) if p.text]
        if 'Price to Book Ratio' in title.text:
            PB_Ratio= [p.text for p in title.findNextSiblings(attrs={'class': 'data lastcolumn'}) if p.text]
    data1={'ROE':ROE,'Current_Ratio':Current_Ratio,'PE_Ratio':PE_Ratio,'debt_to_equity':debt_to_equity,'PB_Ratio':PB_Ratio}
    df=pd.DataFrame(data1,index=[2019])
    return df
```

Stocks Statistics Preview

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Symbol	year	eps	epsgrowth	netincome	shareholderequity	roa	longtermdebt	interestexpense	ebitda	roe	interestcoverageratio	
2	MMM	2015	7.63	0	5000000000	13110000000	0.4192	6790000000	101000000	8529999999	0.381388253	84.45544553	
3	MMM	2016	7.73	0.0125	4840000000	11430000000	0.3476	8800000000	229000000	8310000000	0.423447069	36.28820961	
4	MMM	2017	8.35	0.0809	5060000000	10300000000	0.313	10720000000	207000000	8490000000	0.491262136	41.01449275	
5	MMM	2018	8.13	-0.0263	4870000000	11560000000	0.3044	12160000000	84000000	8770000000	0.421280277	104.4047619	
6	MMM	2019	9.09	0.1181	5360000000	9800000000	0.2684	13490000000	240000000	9260000000	0.546938776	38.58333333	
7	AOS	2015	1.15	0	207800000	1380000000	0.5492	210100000	5700000	343600000	0.15057971	60.28070175	
8	AOS	2016	1.59	0.3841	282900000	1440000000	0.5486	236100000	7400000	456400000	0.196458333	61.67567568	
9	AOS	2017	1.87	0.1734	326500000	1520000000	0.5241	316400000	7300000	526500000	0.214802632	72.12328767	
10	AOS	2018	1.72	-0.0811	296500000	1650000000	0.5157	402900000	10100000	589800000	0.17969697	58.3960396	
11	AOS	2019	2.6	0.5164	444200000	1720000000	0.559	221400000	8400000	623000000	0.258255814	74.16666667	
12	ABT	2015	1.5	0	1710000000	21530000000	0.4916	3390000000	164000000	4390000000	0.079424059	26.76829268	
13	ABT	2016	1.77	0.182	2590000000	21210000000	0.4821	5870000000	178000000	4420000000	0.122112211	24.83146067	
14	ABT	2017	0.93	-0.4739	1060000000	20540000000	0.3733	20680000000	304000000	4600000000	0.051606621	15.13157895	
15	ABT	2018	0.27	-0.7115	344000000	30900000000	0.4052	27210000000	880000000	4990000000	0.011132686	5.670454545	
16	ABT	2019	1.34	3.9755	2320000000	30520000000	0.4544	19360000000	729000000	7120000000	0.076015727	9.766803841	
17	ABBV	2015	1.11	0	1770000000	1740000000	0.0632	10570000000	429000000	6830000000	1.017241379	15.92074592	
18	ABBV	2016	3.15	1.8378	5120000000	3950000000	0.0744	29240000000	719000000	9280000000	1.296202532	12.90681502	
19	ABBV	2017	3.65	0.1587	5920000000	4640000000	0.0701	36440000000	1010000000	10980000000	1.275862069	10.87128713	
20	ABBV	2018	3.31	-0.0932	5280000000	5100000000	0.072	30950000000	1150000000	12070000000	1.035294118	10.49565217	
21	ABBV	2019	3.67	0.1088	5660000000	-8449999999	-0.1423	35000000000	1350000000	13900000000	-0.669822485	10.2962963	

Stock_Statistics

Power BI Visualization



Value Investing

Strong Value Stocks

Stock that is expected to dramatically outperform the average market return and/or the return of comparable **stocks** in the same sector or industry.

Under Valued Stocks

Stock that trades lower price relative to its fundamentals, such as dividends, earnings, or sales, making it appealing to **value** investors

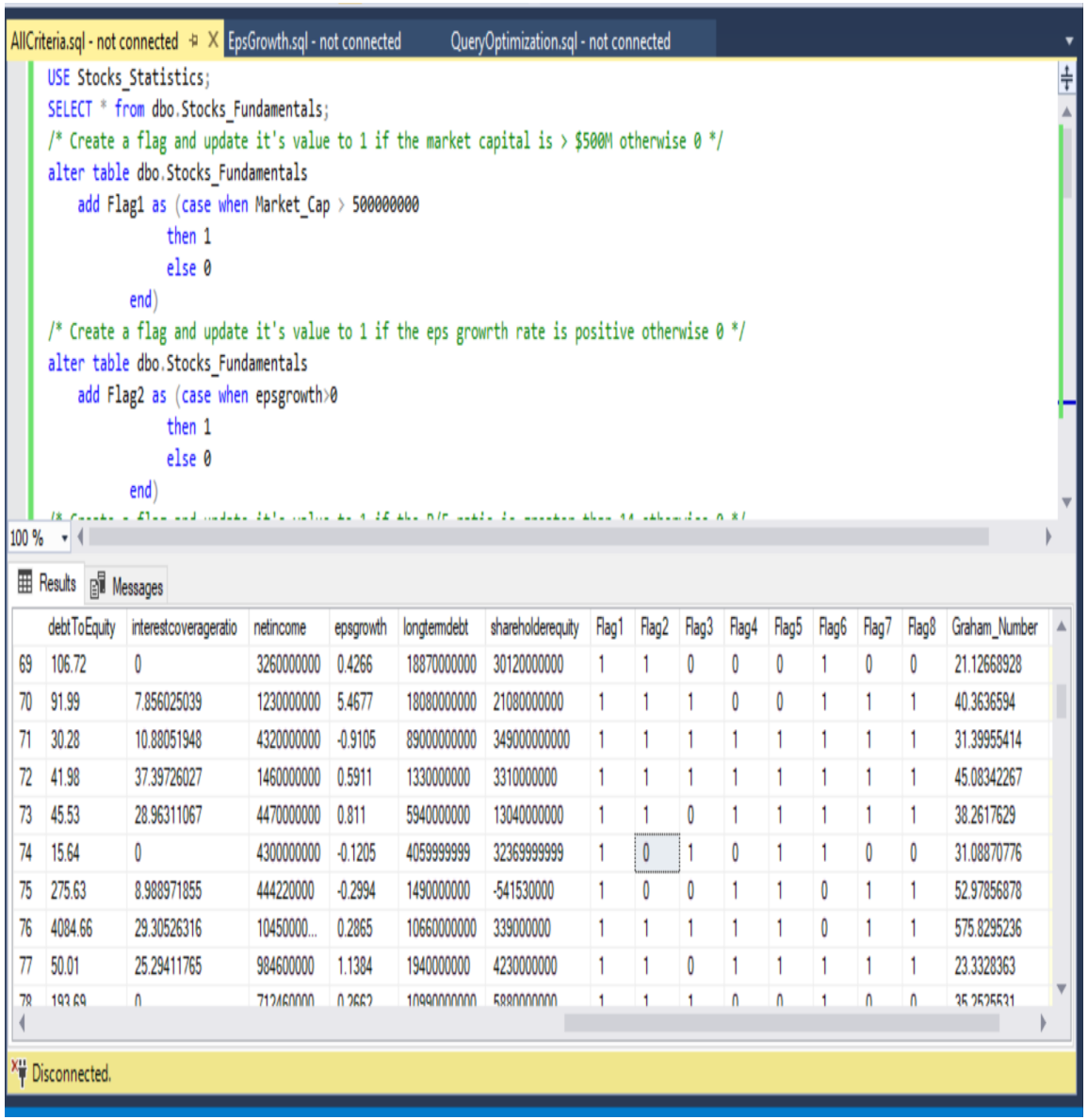
- **We have selected 3 strong value stocks and 2 under valued stock for our Fund.**
- **Combination of both types of stocks reduce the risk of loss**

Strong Value Stocks

Below are Benjamin Graham's eight time-tested criteria to identify strong value stocks.

Benjamin Graham Value Strong Stock Criteria List:

- Ø Large Stable Companies: Minimum market capitalization > $500M
- Ø Positive Earnings & Growing earnings: EPS growth rate should be positive
- Ø Moderate Price / Earnings Ratio (P/E): P/E ratio > 14
- Ø Good return on equity: ROE > 15
- Ø Small long-term debt : Long term debt < 5* total income
- Ø Low Price to Book Value: P/B ratio < 5
- Ø Strong Financial Statements: Current Ratio > 1
- Ø Ability to pay interest: Interest Coverage Ratio >3
- Ø Look for a quality rating that is average or better



	debtToEquity	interestcoverageratio	netincome	epsgrowth	longtermdebt	shareholderequity	Flag1	Flag2	Flag3	Flag4	Flag5	Flag6	Flag7	Flag8	Graham_Number
69	106.72	0	3260000000	0.4266	18870000000	30120000000	1	1	0	0	0	1	0	0	21.12668928
70	91.99	7.856025039	1230000000	5.4677	18080000000	21080000000	1	1	1	0	0	1	1	1	40.3636594
71	30.28	10.88051948	4320000000	-0.9105	89000000000	349000000000	1	1	1	1	1	1	1	1	31.39955414
72	41.98	37.39726027	1460000000	0.5911	1330000000	3310000000	1	1	1	1	1	1	1	1	45.08342267
73	45.53	28.96311067	4470000000	0.811	5940000000	13040000000	1	1	0	1	1	1	1	1	38.2617629
74	15.64	0	4300000000	-0.1205	4059999999	32369999999	1	0	1	0	1	1	0	0	31.08870776
75	275.63	8.988971855	444220000	-0.2994	1490000000	-541530000	1	0	0	1	1	0	1	1	52.97856878
76	4084.66	29.30526316	10450000...	0.2865	10660000000	339000000	1	1	1	1	1	0	1	1	575.8295236
77	50.01	25.29411765	984600000	1.1384	1940000000	4230000000	1	1	0	1	1	1	1	1	23.3328363
78	193.69	0	71246000...	0.2662	10990000000	5880000000	1	1	1	0	0	1	0	0	35.2525531

Strong Value Stock Selection

Steps:

1] Create a flag column for every criteria given in Graham's list

2] Update the flag value to 1 if the given share satisfy the corresponding criteria otherwise keep it 0

3] Select the Stocks which have all the flag values equal to 1

Under valued Stock

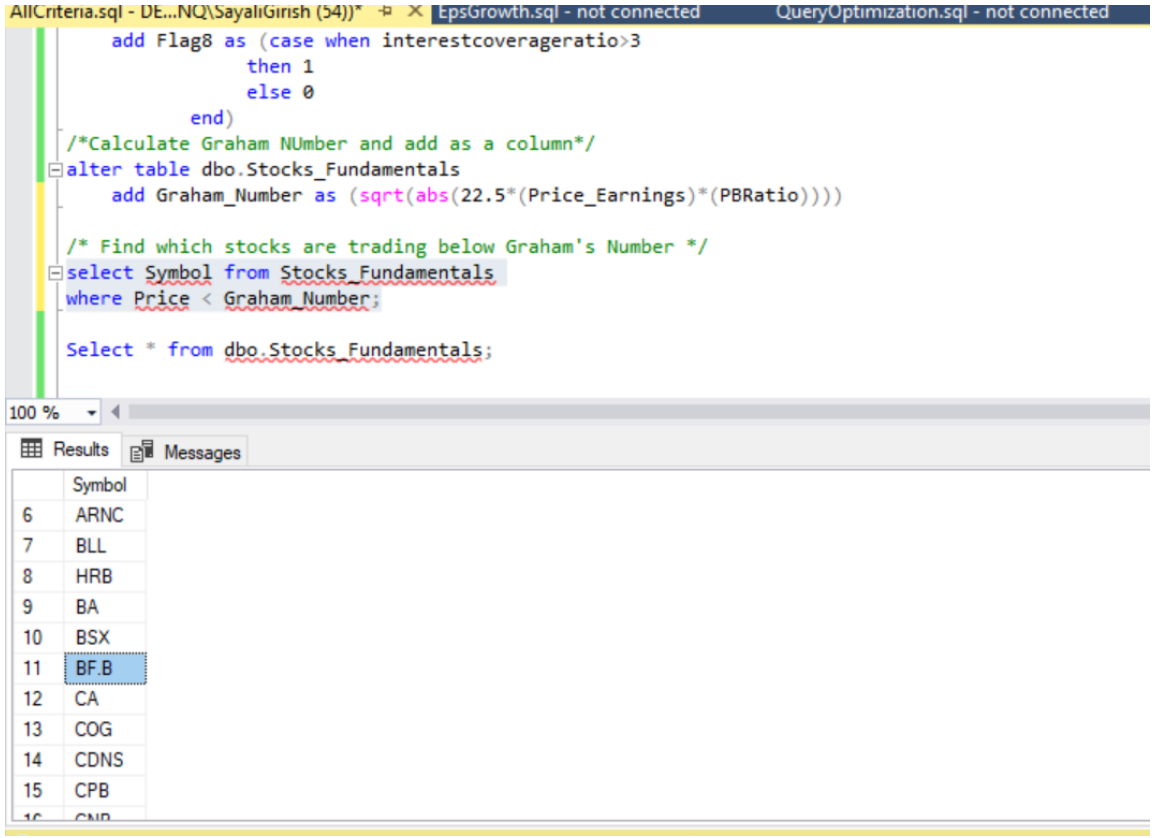
The formula for calculating the Benjamin Graham Number is as follows:

Ben Graham Number = the square root of [22.5 x (Earnings per share (EPS)) x (Book value per share)]

Ben Graham Number – which is designed to represent the actual per-share intrinsic value of the company – you then compare it to the stock's current share price.

If the current share price is lower than the Ben Graham Number, this indicates the stock is undervalued and may be considered as a buy.

If the current share price is higher than the Ben Graham Number, then the stock appears overvalued and not a promising buy candidate.



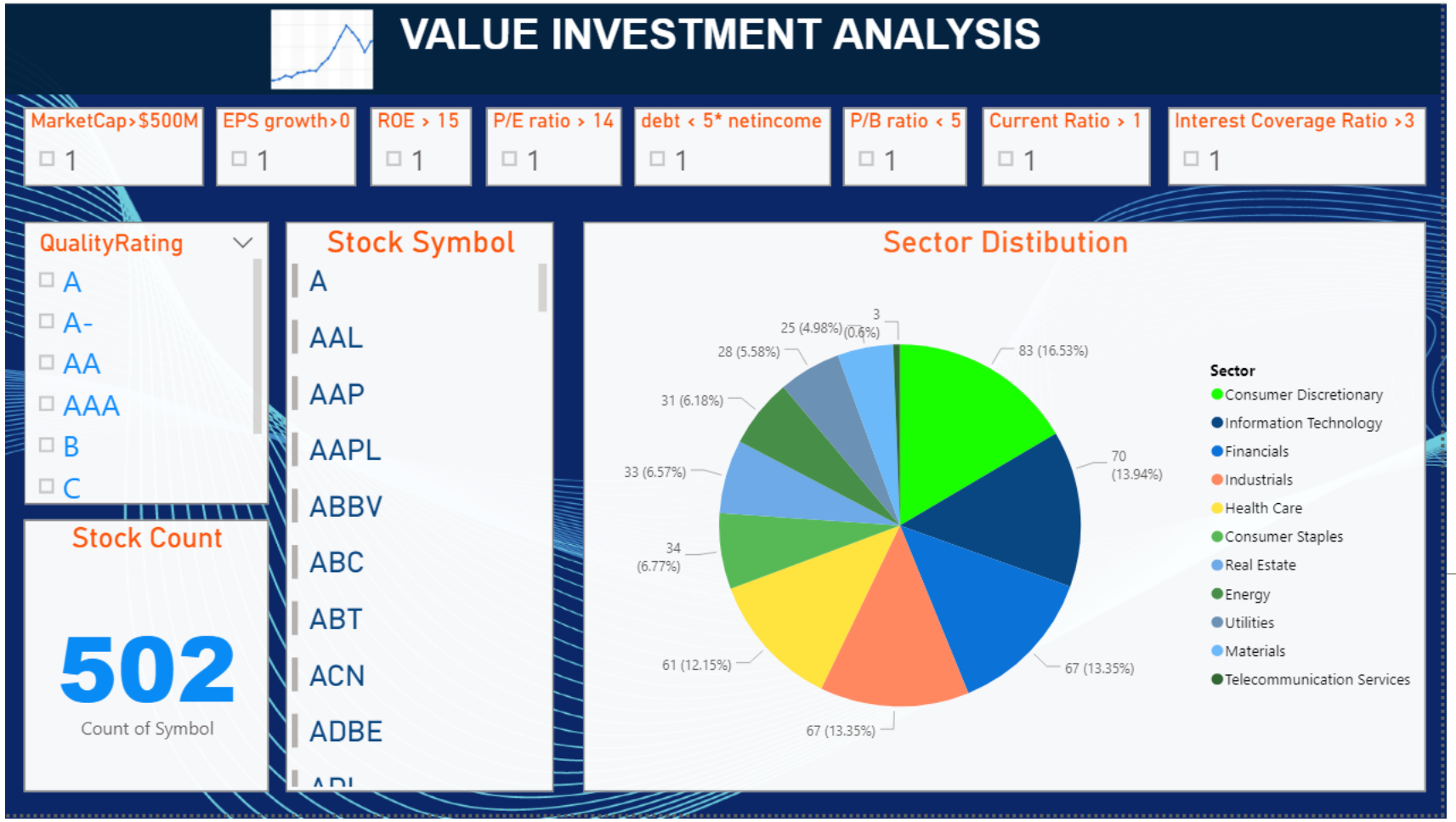
Under Valued Stock Selection

Steps:

1] Create a new column for Graham's Number

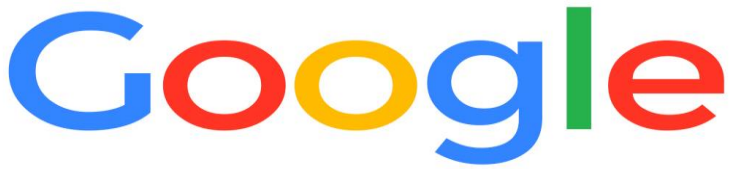
2] Calculate the Graham Number for each Stock

3] Select the Stocks that are trading at a price lower than Graham's Number.



Data Analysis For Value Investing

Selected Stocks



Price Prediction

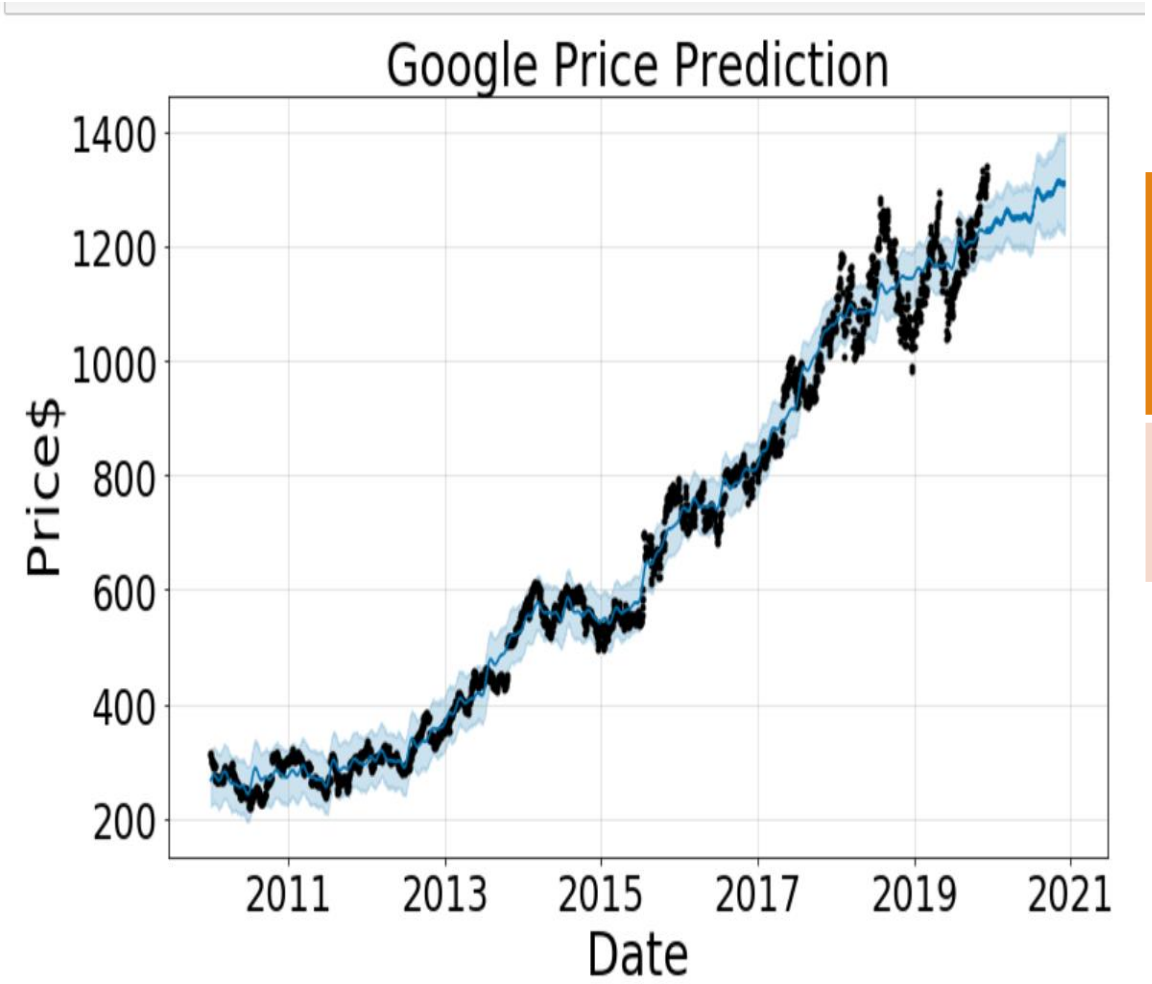
Prophet for Price Prediction:

Prophet is a Python microframework for financial markets.

Why Prophet:

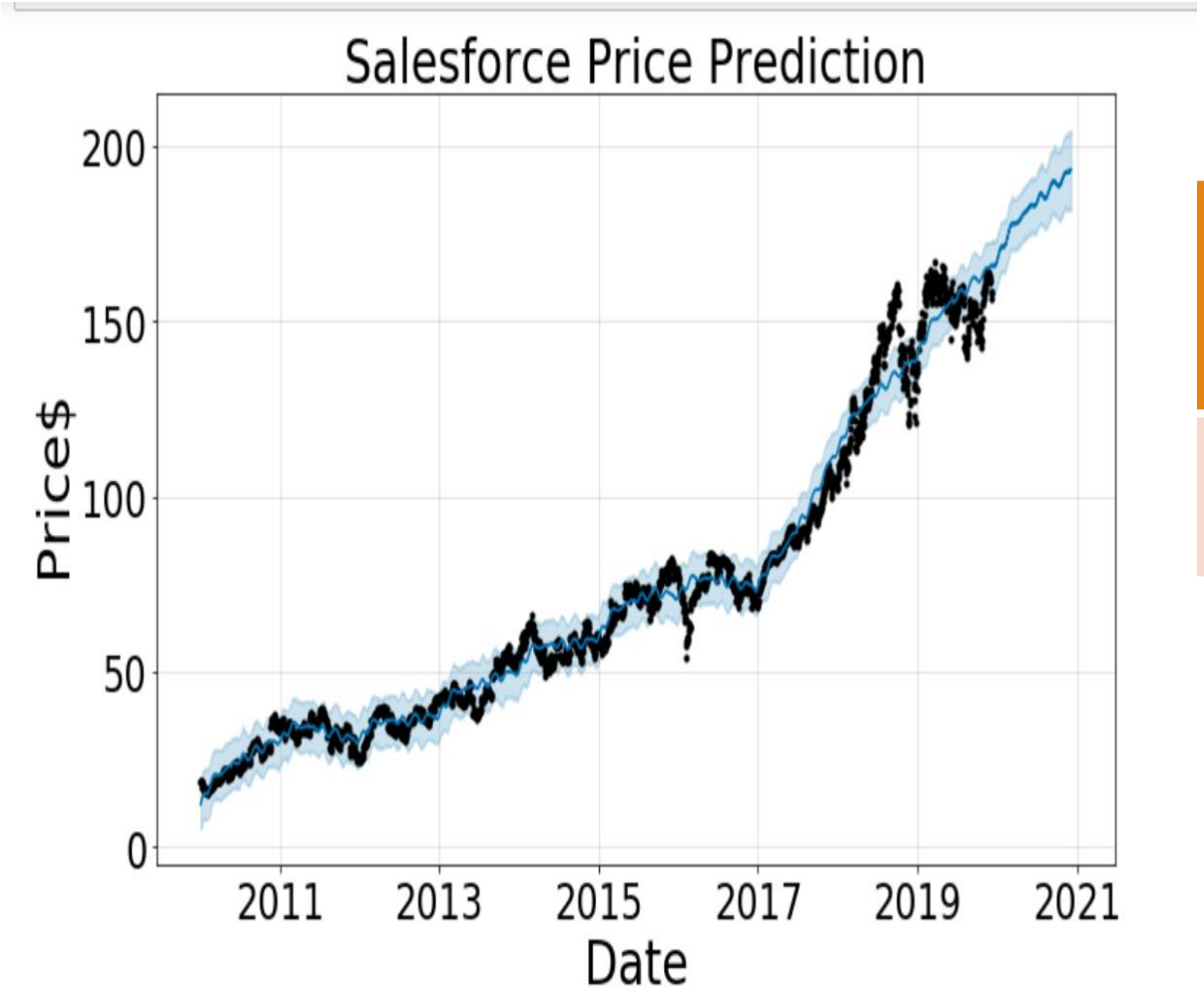
- Prophet is a procedure for forecasting time series data based on an additive model where non-linear trends are fit with yearly, weekly, and daily seasonality, plus holiday effects.
- It works best with time series that have strong seasonal effects and several seasons of historical data.
- Prophet is robust to missing data and shifts in the trend, and typically handles outliers well.

One-year Forecast



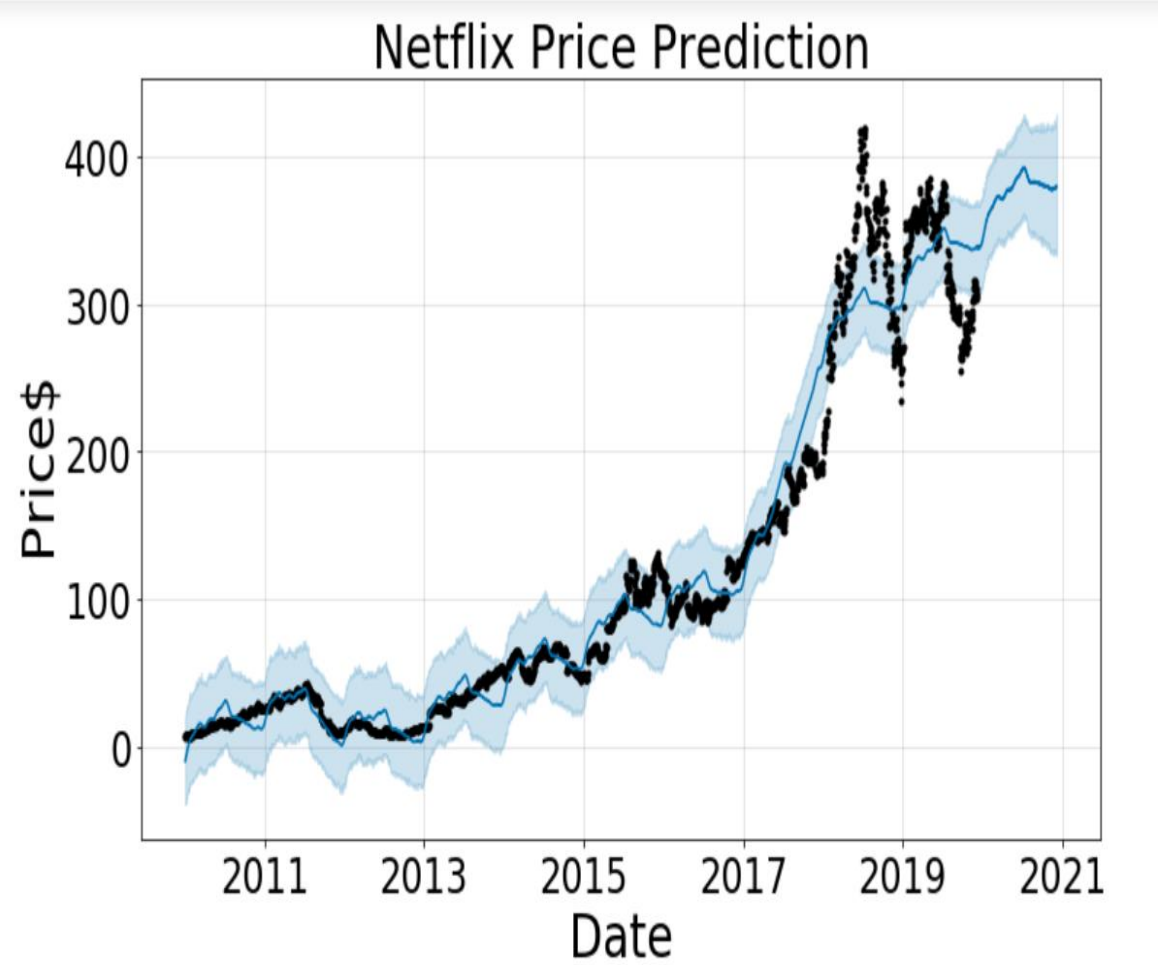
Stock	Average Value After one year	Minimum Value after one year	Maximum Value after one year
Google	$ 1313.0	$1234.34	$1401.51

One-year Forecast



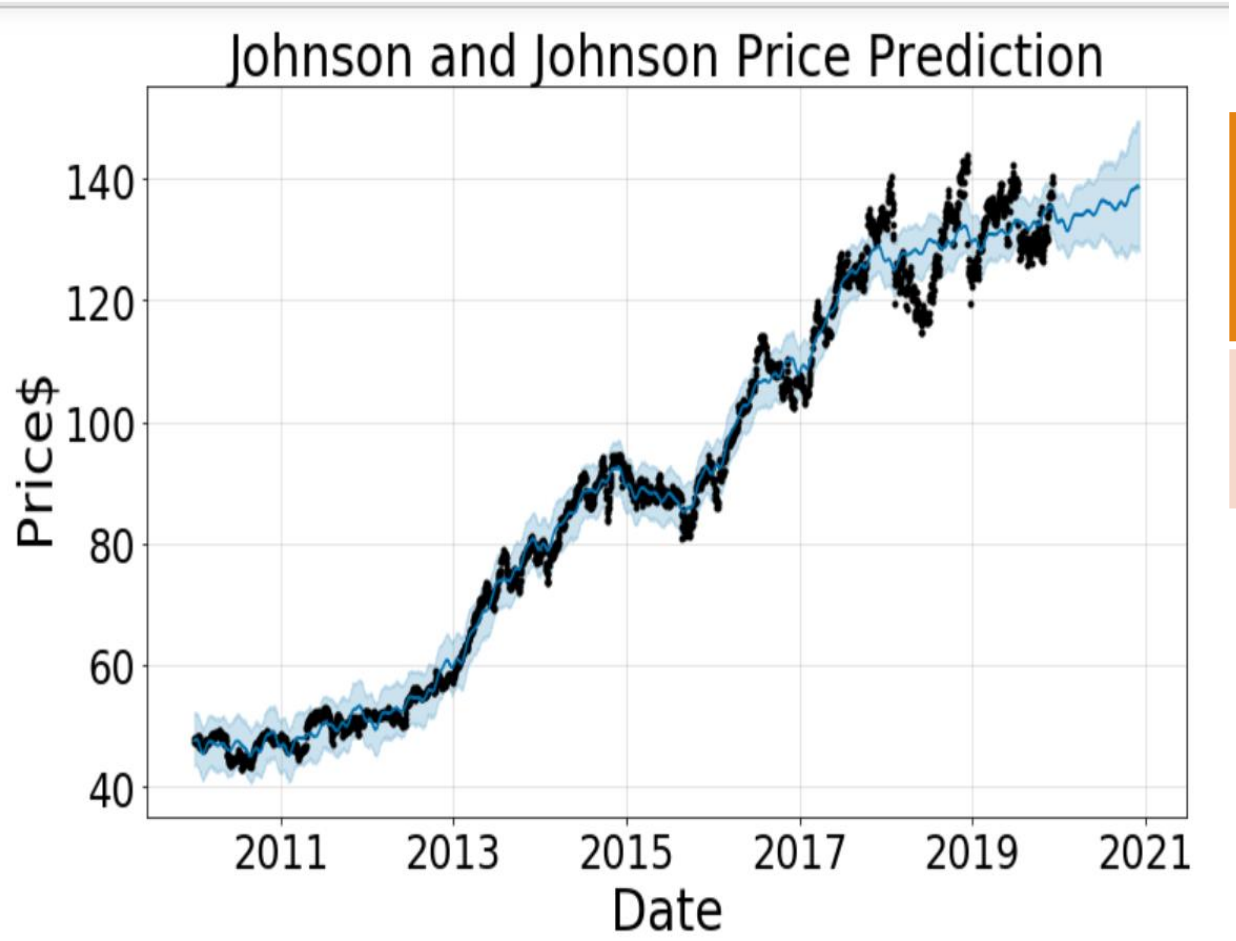
Stock	Average Value After one year	Minimum Value after one year	Maximum Value after one year
CRM	$ 193.28	$182.89	$204.75

One-year Forecast



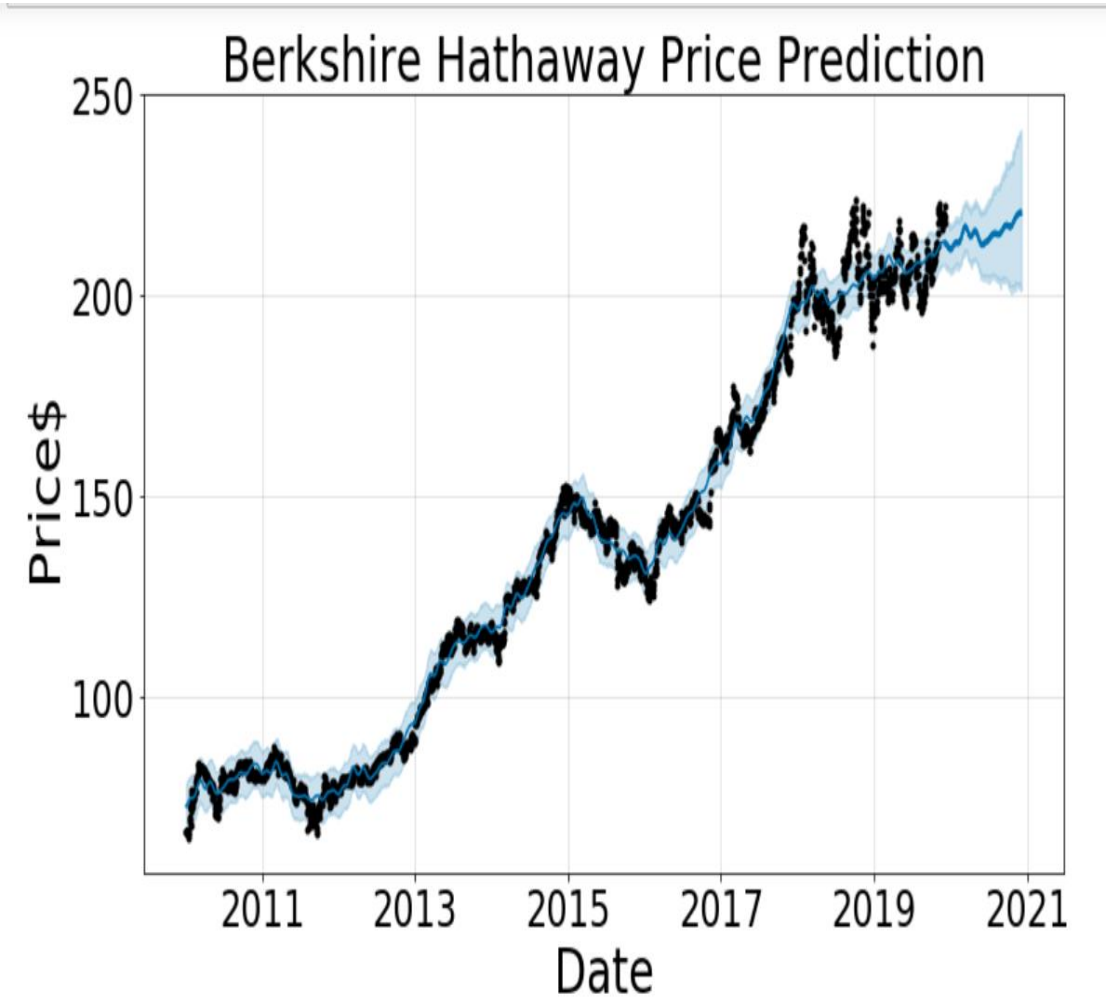
Stock	Average Value After one year	Minimum Value after one year	Maximum Value after one year
NFLX	$379.34	$335.3	$428.36

One-year Forecast



Stock	Average Value After one year	Minimum Value after one year	Maximum Value after one year
JNJ	$142.6	$138.1	$149.55

One-year Forecast



Stock	Average Value After one year	Minimum Value after one year	Maximum Value after one year
BRK-B	$230.21	$186.4	$250.9

Return on Equity

Calculations:

- All the calculations are based on $1M investment in fund
- Return on Equity =

  (Total Predicted price after one year + Dividends) – Total Investment
- There will be 3 options for investment.
- Percentage distribution in each option is as follows:

Stock	Option1	Option2	Option3
GOOGL	20%	25%	20%
CRM	20%	15%	25%
BRK-B	20%	15%	25%
JNJ	20%	20%	15%
NFLX	20%	25%	15%

Option 1

Return on equity = 1157623.38 – 999702= 157921.38 (15.79%)

Stock	Current Price $	No Of Shares allocated	Investment $	Predicted Price $	Dividends	Return after One Year $
GOOGL 20%	1280	156	199680	1313	0	204828
CRM 20%	154.48	1295	200051	193.48	0	250556.6
BRK.B 20%	215	930	199950	230.31	0	214188.3
NFLX 20%	283	707	200081	379.34	0	268193.38
JNJ 20%	130	1538	199940	142.6	0.95	219857.1
Total			999702			1157623.38

Option 2

Return on equity = 1149834.15 – 1001368 = 148466.15 (14.826%)

Stock	Current Price $	No Of Shares allocated	Investment $	Predicted Price $	Dividends	Return after One Year $
GOOGL 25%	1280	196	250880	1313	0	257348
CRM 15%	154.48	971	150000	193.48	0	187869.08
BRK.B 15%	215	698	150700	230.31	0	160756.38
NFLX 20%	283	706	199798	379.34	0	267814.04
JNJ 25%	130	1923	249990	142.6	0.95	276046.65
Total			1001368			1149834.15

Option 3

Return on equity = 1152436.07 – 999694 = 152742.07 (15.28%)

Stock	Current Price $	No Of Shares allocated	Investment $	Predicted Price $	Dividends	Return after One Year $
GOOGL 20%	1280	156	199680	1313	0	204828
CRM 25%	154.48	1618	249949	193.48	0	313050.64
BRK.B 25%	215	1163	250045	230.31	0	267850.53
NFLX 15%	283	530	149990	379.34	0	201050.2
JNJ 15%	130	1154	150020	142.6	0.95	165656.7
Total			999694			1152436.07


Thank You