My project topic deals with stock market analysis. I wanted to us this opportunity to work on a project that I care about and build on in the future. The data was sourced on alphavantage.co which is a great platform that provides API’s arounds stock market real time data . For the purpose of my project, I have used the daily stock prices data. The API returns the stock data for a company in Json format. I used requests and json libraries to get the data in python envinroment.

The API returns the stock price data for one stock per call. So, I had a to write a function to get make repeated calls to the API and get the stock maket data for top 50 companies by market capitalization.

The data was transformed into pandas dataframe and then saved to disk.

There are 6 columns in the dataset

Date of the event

* Open is the opening price of a stock on the day
* Close is the closing price of a stock on the day
* High is the daily highest price of the stock
* Low is the daily lowest price of the stock
* Volume is the daily traded volume for the stock
* All the datatypes are numeric except for date

I will be using the closing price, volume and date for my further analysis

This is the function that I used to make multiple calls to the API and store the results to a pandas dataframe. It takes list of stock names as input and returns a dataframe of all 50 stocks.

Most people make their stock trading decisions based on word of mouth from family, friends. I wanted to go beyond that and make calculated decisions based on technical analysis of the stocks.

My Analysis objectives were to write functions to calculate various technical indicator and plot them. To implement a trading strategy that will give me buy and sell signals and finally analyse the twitter sentiment and try to find a pattern with the price movement.

Volume indicates the amount of shares that are bought and sold. Volume is not really a technical indicator but I as curious to find out the trends in yearly traded volume for different stocks. Plotted the yearly average volume from 2014 to 2018 for all stocks.

Simple Moving average is the rolling mean for the close price for n day time period. So 50 day simple moving average is basically the basically the average of the close price for last 50 days. Exponential Moving average is similar but gives more weight to the most recent data points

.I wrote functions to calculate SMA and EMA for any period, stock and date.

Macd is the difference between the 12 day EMA and 26 EMA of the close price and the signal line is 9 day ema of the macd. When MACD line crosses the signal line from below, it’s a buy signal. When MACD line crosses the signal line from above, it’s a sell signal. Wrote function to get the macd for any stock in the dataset.

Relative Strength index is yet another indicator that I implemented but due to time constraints I’ll move past it for now and come back later if I have time

Now comes the fun stuff , implementing an actionable trading strategy. For the strategy, I used the combination of the MACD indicator and volume.

* If volume > average volume for last 3 days and MACD line crosses the signal line from below-BUY
* If volume > average volume for last 3 days and MACD line crosses the signal line from above-SELL
* Otherwise Hold

As you can see here, my strategy gave a sell signal at two points and the prices have dropped after that, and the prices have increased after the buy signal. It works!

I tried the strategy on a bunch of different stocks and found similar trends.

Finally, I used VADER sentiment to get the twitter sentiment analysis for tesla . I looked at the compound score and plotted it on the time axis.

Python is fun and can make you rich too!