Predicting Apple Stock Market Buy Action

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# Which Domain?

Data is being collected from different websites, mainly from Yahoo Finance:

* [Yahoo Finance - Stock Market Live, Quotes, Business & Finance News](https://finance.yahoo.com/). Stock market prices for the different companies:
  1. [Dell Technologies Inc. (DELL) Stock Price, News, Quote & History - Yahoo Finance](https://finance.yahoo.com/quote/DELL?p=DELL&.tsrc=fin-srch) : Dell stock price data historic
  2. [Alphabet Inc. (GOOG) Stock Price, News, Quote & History - Yahoo Finance](https://finance.yahoo.com/quote/GOOG?p=GOOG&.tsrc=fin-srch) : Google stock price historic
  3. [SamsungElec (005930.KS) Stock Price, News, Quote & History - Yahoo Finance](https://finance.yahoo.com/quote/005930.KS?p=005930.KS&.tsrc=fin-srch) Samsung stock price historic
  4. [GC=F 1,876.00 -3.60 -0.19% : Gold - Yahoo Finance](https://finance.yahoo.com/quote/GC%3DF/history?p=GC%3DF) : price of gold daily
  5. [Walt Disney Company (The) (DIS) Stock Price, News, Quote & History - Yahoo Finance](https://finance.yahoo.com/quote/DIS?p=DIS&.tsrc=fin-srch): Prices of Disney Stocks
* <https://www.kaggle.com/> Using data set available for a competition as features for Apple stock prices:
  1. <https://www.kaggle.com/c/jane-street-market-prediction/data> : Data from Jane Street Market, available for a Kaggle competition and it will be used to analyze the coded features that they have with the apple stock prices
* [API Marketplace - Free Public & Open Rest APIs | RapidAPI](https://rapidapi.com/marketplace) API to get daily temperature.
* <https://www.macrotrends.net/> Used to get Oil historic prices.
* [Inflation Calculator | Find US Dollar's Value from 1913-2021 (usinflationcalculator.com)](https://www.usinflationcalculator.com/):
  1. [Consumer Price Index Data from 1913 to 2021 | US Inflation Calculator](https://www.usinflationcalculator.com/inflation/consumer-price-index-and-annual-percent-changes-from-1913-to-2008/)
* Mainly Apple Tech Competitors information was retrieved from different articles:
  1. [Apple SWOT 2021 | SWOT Analysis of Apple | Business Strategy Hub (bstrategyhub.com)](https://bstrategyhub.com/swot-analysis-of-apple-apple-swot/)
  2. [10 Of Apple's Biggest Competitors - Eskify](http://eskify.com/10-apples-biggest-competitors/)

# Which Data?

A computer screen capture

Description automatically generated with medium confidenceThe data set that will be used in this project are mainly in form of tables on different websites, an example of the data to use is the following one:

All data to be retrieved from Yahoo Finance is on table form, based on daily prices.

[Dell Technologies Inc. (DELL) Stock Price, News, Quote & History - Yahoo Finance](https://finance.yahoo.com/quote/DELL?p=DELL&.tsrc=fin-srch) : Dell stock price data historic

[Alphabet Inc. (GOOG) Stock Price, News, Quote & History - Yahoo Finance](https://finance.yahoo.com/quote/GOOG?p=GOOG&.tsrc=fin-srch) : Google stock price historic

[SamsungElec (005930.KS) Stock Price, News, Quote & History - Yahoo Finance](https://finance.yahoo.com/quote/005930.KS?p=005930.KS&.tsrc=fin-srch) Samsung stock price historic

[GC=F 1,876.00 -3.60 -0.19% : Gold - Yahoo Finance](https://finance.yahoo.com/quote/GC%3DF/history?p=GC%3DF) : price of gold daily

[Walt Disney Company (The) (DIS) Stock Price, News, Quote & History - Yahoo Finance](https://finance.yahoo.com/quote/DIS?p=DIS&.tsrc=fin-srch) : Prices of Disney Stocks

Next data set to use come in a .csv format, and I bought the data set from the website listed here, the dataset contains 2 columns: Date and Closing price for the Crude oil, from 1986 to 2021. It has 8832 observations:

[Home | MacroTrends (dpdcart.com)](https://macrotrends.dpdcart.com/) : Price Oil daily from 1986, will be used as a feature, this data set was bought by me on the website.

A computer screen capture

Description automatically generated with medium confidenceFor the Consumer Price Index data, the data set is on the website listed below and it comes in a online table form:

[Consumer Price Index Data from 1913 to 2021 | US Inflation Calculator](https://www.usinflationcalculator.com/inflation/consumer-price-index-and-annual-percent-changes-from-1913-to-2008/) : CPI monthly values

For daily temperature data, I’ll use the following API to collect the historical data points.

[OpenWeatherMap API - Free Weather Data (for Developers) (rapidapi.com)](https://rapidapi.com/community/api/open-weather-map) : Api for Daily temperature historic data

In Kaggle.com there is a competition hosted by Janet Street market, they facilitate big data sets the include features that will be used to predict an action of buy or not in a certain date, this data is presented in .csv format and includes date (integer) and features that are coded with numbers, features are not given by name but by numbers:

A computer screen capture

Description automatically generated with low confidence

<https://www.kaggle.com/c/jane-street-market-prediction/data>

# Research Questions? Benefits? Why analyzes these data?

Question: May I know when to buy or not in a future an Apple Stock, based prices of closest competitors, oil prices, gold process, temperature of the day and Disney stock price?

My proposal consists of to analyze prices of the closest Apple Tech Competitors, like Samsung, Google, Dell and Microsoft, if these prices affect the Apple stock prices, can I predict Apple prices in the future? I will introduce some different features as temperature of the day for Florida, and Disney Stock Prices, is Disney is always on the race for latest technology, for Disney is more oriented to entertainment, however, I can’t imagine going to Disney without my iPhone, Air Pods and iWatch.

Introducing some more economic indicators features, I will use gold prices and crude oil prices to predict apple stock prices.

I am analyzing the possibility to add cryptocurrency like the Bitcoin into this list as a suggestion of one of my peers on the Teams channel.

# What Method?

Most of the data will be collected using web scrapping, with BeautifulSoup. I’ll use the weather API to retrieve temperature data points, other of data was bought on the Macrotrends website, and it is on a .csv format, Janet Street Market was downloaded it from Kaggle website in a .csv format, all these data will be processed in a Jupyter Notebook, using mainly Pandas to get them all in a data frames that will be cleaned and organized to be able to join these into one whole data frame to use the features to predict the target. A classification model will be used to predict 1 buy or 0 not buy, based on the price of the stock that will be minor or equal the mean of the minimum historic monthly values in the last year available.

# Potential Issues?

* Format of the data, availability of daily historic data by feature. Some of the data comes from different sources and can have different formats.
* How to predict action live using a stock market API. This part I must research more to be able to run the model live, this would mean that any user can just see the result of 1 or 0 on a certain date when the market opens.
* Time, time is always a risk factor because of all the data processing time.

# Concluding Remarks

Stock market traders are always looking for opportunities and insights of when to buy and when to sell, it is important to understand how the market moves, and what are the factors that are related with the strategy that you set as trading trigger. Market reflects all known information [1], so this means that everything that happens in the world affect the stock market, markets set prices of every good, Apple is always at the top of the news whenever a new product is coming out, prices are set, predictions are made, and the shareholders hold their breath. As an Apple stock owner, I am interested to know if I can predict buying more stocks or not in the future, or maybe predict that in summer would be better than winter to buy, or if the Apple competitors stock prices will give me insights to buy or not. As a Disney fanatic and a stock owner, I would like to know if Disney stock prices can give me an idea to buy or not Apple. Other economic popular indicators as CPI, gold and oil prices could also tell me if buying or not Apple stocks is a good option. Shareholders based most of their decision to buy in low prices, me and my husband for example set a minimum and a maximum to sell and buy, based on these limits, predict when to buy will be beneficial for us and for others as investors in Apple. Using a classification algorithm to predict the action for the trading date, I’ll use all the data explained before to predict this target.

References

[1] <https://www.investopedia.com/articles/stocks/12/history-apple-stock-increases.asp>

<https://www.usatoday.com/story/money/markets/2012/10/09/apple-stock-must-own/1609157/>