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MARKET PREDICTOR

ENSE 489 Project AI

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ARTIFICIAL INTELLIGENCE (AI)



01.

INTRODUCTION



INTRODUCTION

Today's day, the average household salary is \$54,000/year

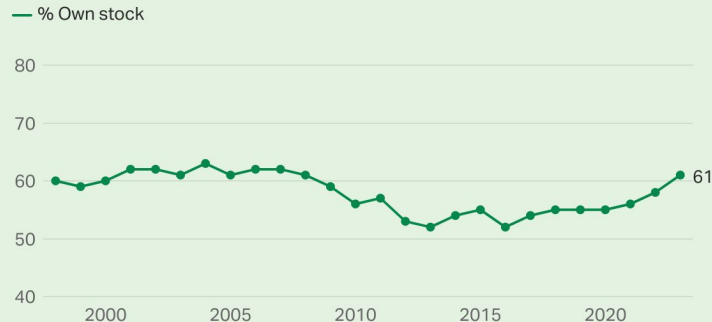
Not enough people are investing, especially young people.

The younger you begin investing, the more "compound growth" you will experience.

Our goal: increase loss-prevention on a long-term time horizon.

U.S. Stock Ownership, Annual Trends

Do you, personally, or jointly with a spouse, have any money invested in the stock market right now -- either in an individual stock, a stock mutual fund, or in a self-directed 401(k) or IRA?



Based on annual averages from Gallup polls

GALLUP

02.

ANALYSIS OF SOCIAL AND ECONOMIC ISSUE

ANALYSIS OF SOCIAL AND ECONOMIC ISSUE

52% of people in america invest in the markets.

In the long-term, sets people up for creating generational wealth.

The average return of the SP500 over the last 30 years, is 7.5%.

Assuming we invest \$1000 monthly for 30 years, currently would have \$1,350,000.

Although significant, not enough to retire, to retire, you need ~\$2,500,000 in investment.



<https://www.gq-magazine.co.uk/lifestyle/article/investing-for-beginners>

ANALYSIS OF SOCIAL AND ECONOMIC ISSUE

Warren Buffet's rule of investing "loses beat gains; if you lose 10% in the markets, you need to earn 11% to get back to where you are",

Which leads us to believe, in order to invest "above" average we need to avoid losses, which is where our AI comes in with next day close price prediction.

We could attempt to guide our investors to sell when their assets are worth more if they planned to exit the market.

This would be a factor towards avoiding losses, with the knowledge of knowing a stock is favored to move up.

Assuming we bring up average ROI from 7.5% to 10%, their final investment portfolio amount would be roughly \$2,260,000

This is a difference of tens of thousands of retirement income, the difference between enjoying your "golden-years" or working till the day you die

PROBLEM VS. SOLUTION



DISCLAIMER

This should NOT be used as a primary decider as this is not 100% accurate.

Relying on AI will hinder your ability to do research on your own.

REMINDER



ARTIFICIAL INTELLIGENCE (AI)

03.

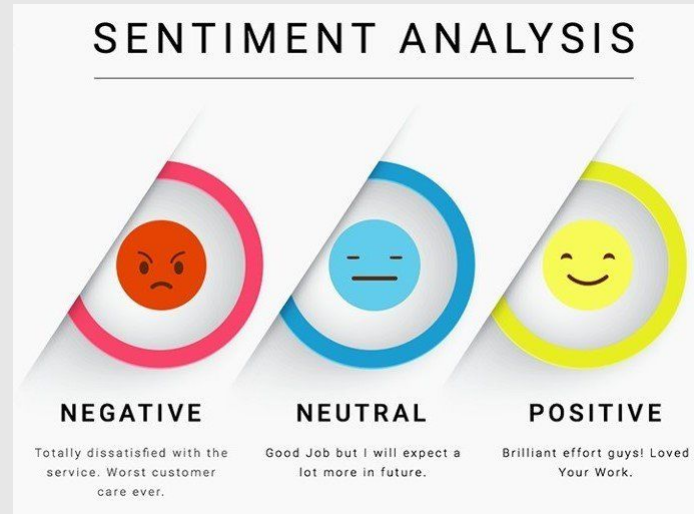
DESIGN OF PROTOTYPE SYSTEM

DESIGN OF PROTOTYPE SYSTEM

Originally we thought of building a simple market predictor, based off of open and close price; but realized that would not take into account social market factors.

Therefore we built a market predictor based off of stock data plus twitter sentiments.

Allowing the user to be more educated if the stock is being talked about positively, neutrally, or negatively.

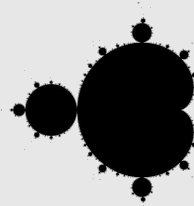


<https://www.altexsoft.com/blog/business/sentiment-analysis-types-to-ols-and-use-cases/>

DESIGN OF PROTOTYPE SYSTEM

Libraries and technologies used:

TextBlob



TextBlob

<https://textblob.readthedocs.io/en/dev/>

yFinance



<https://rjunaidraza.medium.com/yahoo-finance-api-to-get-stocks-tickers-data-in-python-c49820249a18>

PlayWright



<https://harshasuraweera.medium.com/introduction-to-microsoft-playwright-and-its-features-part-0-1acde194fccc>

TensorFlow



TensorFlow

<https://en.wikipedia.org/wiki/TensorFlow>

Other various generic python mathematical libraries

ARTIFICIAL INTELLIGENCE (AI)

04.

IMPLEMENTATION OF PROTOTYPE



IMPLEMENTATION OF PROTOTYPE SYSTEM

Twitter data collection

- 2 authentication paths
- DOM scraping

Twitter data analysis

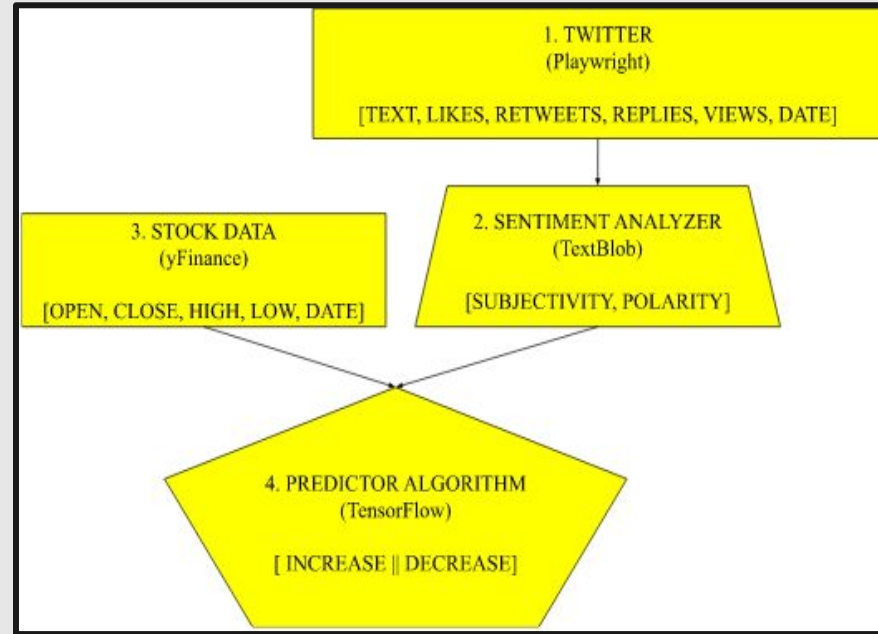
- TextBlob sentiment analysis

Stock data collection

- yFinance API calls

Predictor algorithm

- Our trained AI using historical data of markets and tweets.



TWITTER DATA COLLECTION AND ANALYSIS

Twitter Authentication & Collection:

2 pathways:

- Email & Password

- Email & Username & Password

The paths are chosen by Twitter at random; If path one is taking too long, then attempts path 2.

Next we search by stock ticker along with hashtag, "[ticker]" to search relevant tweets.

Using the DOM we then scrape them and remove duplicated, upload to JSON file.

Twitter Analysis:

Read the entire twitter JSON from our project, save within an array of variables.

Using sentiment analysis tool within TextBlob package, analyze each tweet and get two important float values, subjectivity, and polarity.

Data is added and saved for later use.



<https://kadence.com/en-us/an-introduction-to-data-collection-in-marketing-research/>

IMPLEMENTATION OF PROTOTYPE



STOCK DATA COLLECTION

We wanted to get OHLC data (open, high, low, close)

Can be done with yFinance Python package, which has a simple API call

We provide a ticker, and receive info via a 200 yFinance API call

Once done, we can save it in the JSON, within file structure for later use

IMPLEMENTATION OF PROTOTYPE



PREDICTOR ALGORITHM

The OHLC data will be normalized by dividing all metrics by the open price

Done to get a ratio, usually between 0.9 and 1.1 of the stocks metrics

This is done to get price disparity of stocks

ML algorithm is fed the average polarity, subjectivity, and the close and high ratio, to generate a prediction of tomorrow's close price



05.



DISCUSSION

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DISCUSSION

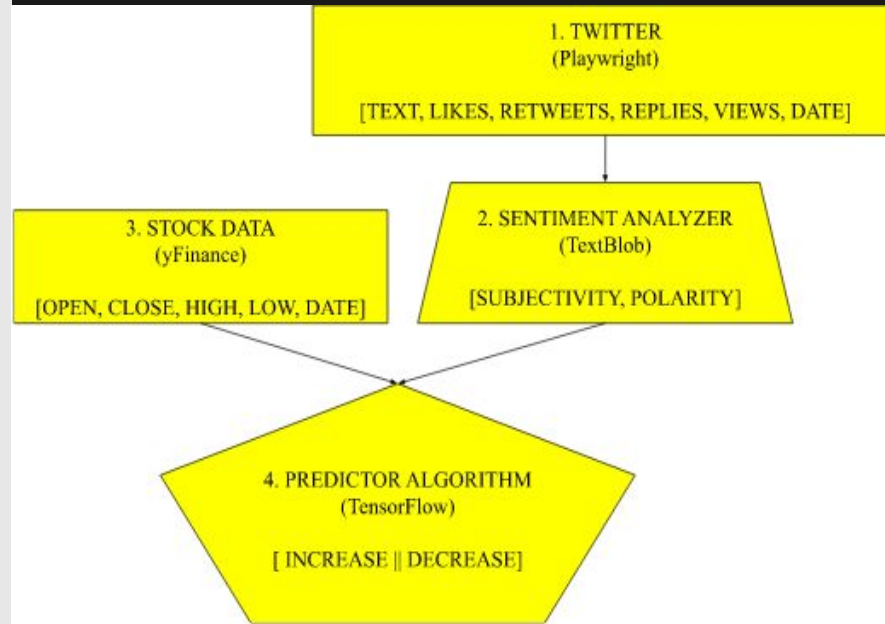
All in all 4 major components working together

Is this ethical?

Yes, it is meant to support people who are already investing.

Better than other systems?

Yes, it takes into account the social aspects; but no because we do not have the same resources such as hedge funds or banks.



RESULTS

STOCK	July 10 2023			July 11 2023			July 12 2023			July 13 2023			July 14 2023		
	OPEN	CLOSE	PREDICTION	OPEN	CLOSE	PREDICTION	OPEN	CLOSE	PREDICTION	OPEN	CLOSE	PREDICTION	OPEN	CLOSE	PREDICTION
AAPL		188.61	INCREASE	189.16	188.08	INCREASE	189.68	189.77	INCREASE	190.5	190.54	DECREASE	190.23	190.69	INCREASE
AMZN		127.13	DECREASE	127.75	128.78	INCREASE	130.31	130.8	DECREASE	134.04	134.3	INCREASE	134.06	134.68	DECREASE
MSFT		331.83	INCREASE	331.06	332.47	INCREASE	336.6	337.2	INCREASE	339.56	342.66	INCREASE	347.59	345.24	INCREASE
NVDA		421.8	INCREASE	424.81	424.05	INCREASE	430.33	439.02	INCREASE	445.18	459.77	INCREASE	465.83	454.69	INCREASE
TSLA		269.61	INCREASE	268.65	269.79	INCREASE	276.32	271.99	INCREASE	274.59	277.9	INCREASE	277.01	281.38	INCREASE
STOCK	July 17 2023			July 18 2023			July 19 2023			July 20 2023			July 21 2023		
	OPEN	CLOSE	PREDICTION	OPEN	CLOSE	PREDICTION	OPEN	CLOSE	PREDICTION	OPEN	CLOSE	PREDICTION	OPEN	CLOSE	PREDICTION
AAPL	191.9	193.99	INCREASE	193.35	193.73	INCREASE	193.1	195.1	DECREASE	195.09	193.13	DECREASE	194.1	191.94	
AMZN	134.56	133.56	DECREASE	132.71	132.83	INCREASE	133.39	135.36	DECREASE	134.07	129.96	INCREASE	131.34	130	
MSFT	345.68	345.73	INCREASE	345.83	359.49	INCREASE	361.75	355.08	DECREASE	353.57	346.87	DECREASE	349.15	343.77	
NVDA	462.89	464.61	INCREASE	467.01	474.94	INCREASE	474.64	470.77	DECREASE	465.07	455.2	INCREASE	457.88	443.09	
TSLA	286.63	290.38	INCREASE	290.15	293.34	INCREASE	296.04	291.26	DECREASE	279.56	262.9	INCREASE	268	260.02	
All the above predictions were done in the evening of the night before the next day; a green cell means the prediction from todays close to tomorrows close was correct; while a red cell means it was incorrect.															
TOTAL	45	CORRECT	34	INCORRECT	11	ACCURACY	75.56								

75.56% ACCURACY

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LIVE DEMO

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06.

CONCLUSION



CONCLUSION

Overall, we believe this can be a very powerful tool in loss-reduction.

Strength lies in the efficiency of the program; the technical stock data and social sentiment give a quick prediction.

Weakness lies where it is not 100% accurate due to unreliable market conditions and market shocks, therefore it should not be fully relied upon.

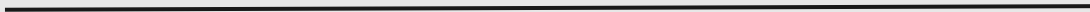
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(AI)



07.

FUTURE WORK





EXPAND STOCK COVERAGE

Expand on how many stocks we cover, currently we only cover 5 stocks which we chose to research



IMPROVE SENTIMENT SCRAPER

Expanding on the sentiments from different platforms, giving us a positive, neutral, or negative sentiments making predictions more accurate

/ [AI]

08.

REFERENCES

REFERENCES

- Gillham, D. (2010, August 17). *Trading the stock market – why most traders fail*. Wealth Within.
<https://www.wealthwithin.com.au/learning-centre/share-trading-tips/trading-the-stock-market#:~:text=Anyone%20who%20starts%20down%20the.per%20cent%20make%20money%20consistently>.
- Jones, J. M. (2023, May 31). *What percentage of Americans own stock?*. Gallup.com. <https://news.gallup.com/poll/266807/percentage-americans-owns-stock.aspx>
- Parker, K. (2020, March 25). *More than half of U.S. households have some investment in the stock market*. Pew Research Center.
<https://www.pewresearch.org/short-reads/2020/03/25/more-than-half-of-u-s-households-have-some-investment-in-the-stock-market/>
- Russo, F. (2022, December 7). *How much does the average American make in 2022?*. First Republic .
<https://www.firstrepublic.com/insights-education/how-much-does-the-average-american-make>



THANKS

Any Questions?

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