PYTHON
PROJECT

THE TRADING BOT

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CONTENT

INTRODUCTION

Project Overview :

The AI Trading Bot project is a cutting-edge initiative aimed at leveraging artificial intelligence and machine learning algorithms to optimize trading strategies in financial markets.

Develop an AI-powered trading bot capable of making data-driven decisions in real-time.

Optimize trading strategies to maximize profit potential while minimizing risk.

OUR TEAM

Ishaan Jain
(42)

Writing the buy sell logic for the code , making the presentation, generation of graphs for the trading bot

Gurshaan
(35)

Making of the report for the bot, backtesting the trading bot and writing the main body of the trader code

Mayank
(62)

Writing the sentiment logic to study from the internet , making of the presentation , installation and execution of anaconda

LIBRARIES

ALPACA

Alpaca l ibrary in Python provides easy-to-use tools for accessing the Alpaca API, which allows developers to interact with Alpaca' s brokerage services for trading stocks and assets.

LUMIBOT

The Trader class provides seamless integration with popular trading platforms, allowing developers to connect their algorithms to l ive trading environments.

YAHOO BACKTESTING

The lumibot
Yahoo Data Backtesting class is a component of the lumibot l ibrary, designed to facilitate backtesting of trading strategies using historical data
obtained from Yahoo Finance. This class
offers tools for simulating and evaluating the
performance of trading algorithms based on
past market data.

WORKING LOGIC

The bot works by a library known as lumibot and by a software named anaconda / miniconda which supports the trading bot . For now the buy sell logic is mainly developed and is the main thing which makes every trading bot unique

BACKTESTING

We have implemented two logics for the backtesting of the trading bot which are explained as follows :-

- Paper trading - Using a feature known as Alpaca paper trading feature. By integrating Alpaca's paper trading functionality into our AI trading bot, we can backtest and fine-tune trading algorithms before deploying them in live markets.
- Yahoo Backtesting - We tested the bot using the data of the apple stock of the past 15 years using the yahoo backtesting feeature and obtained positive results

THE BUYING LOGIC

- The Bot is trained to check the sentiments of the market for the purpose of buying a stock . It will look for certain keywords in the news and will treat it as positive or negative news

- If the news is positive the model will treat it as 1 and if negative it will be treated as 0 . If the outcome is 1 the bot will buy the following stock based on the market price

THE SELLING LOGIC

- For selling a stock in market the model will study the market sentiments or you can set a limit of the multiple that if it reaches a certain amount the bot should sell the stock

- To minimize loss in the case of market crash or a falling stock the stoploss feature is also introduced which will sell the stock if it reaches a limit specified by the user

RESULTS AND FINDINGS

The trading bot while bieng backtested generated profit 3 out of 4 times which is considered as a great number in the stock market

ANALYSIS

01

ANACONDA

Anaconda is a popular open-source distribution of the Python and R programming languages, used for data science, machine learning, and scientific computing. It comes with a package manager called conda, which allows for the creation of isolated environments .

02

PERFORMANCE

The trading bot performed positively 3 out of 4 times while backtesting which is a great result and outcome for the trading bot

03

STOPLOSS

We have Added The stop-loss feature is a risk management tool used in trading to minimize losses by automatically selling a security when it reaches a predetermined price level

04

OUTCOME

As a result the bot can have a great application in todays world and can extensively used hence generating income for the developers as well if launched in the real

WORKING OF THE BOT

The Backtesting of the bot done by the approach of sentiment analysis is as follows :-

- Sentiment Analysis: Natural Language Processing (NLP) techniques are applied to analyze the collected textual data. This involves processing text to determine the sentiment expressed, such as positive, negative, or neutral. Sentiment analysis algorithms may use techniques like bag-of-words, word embeddings (e.g., Word2Vec, GloVe) to understand the sentiment in the text

Win Rate:

- Percentage of winning trades out of total trades executed by the bot.

Risk-Adjusted Returns:

- Metrics such as Sharpe ratio, Sort no ratio, or Calmar ratio.

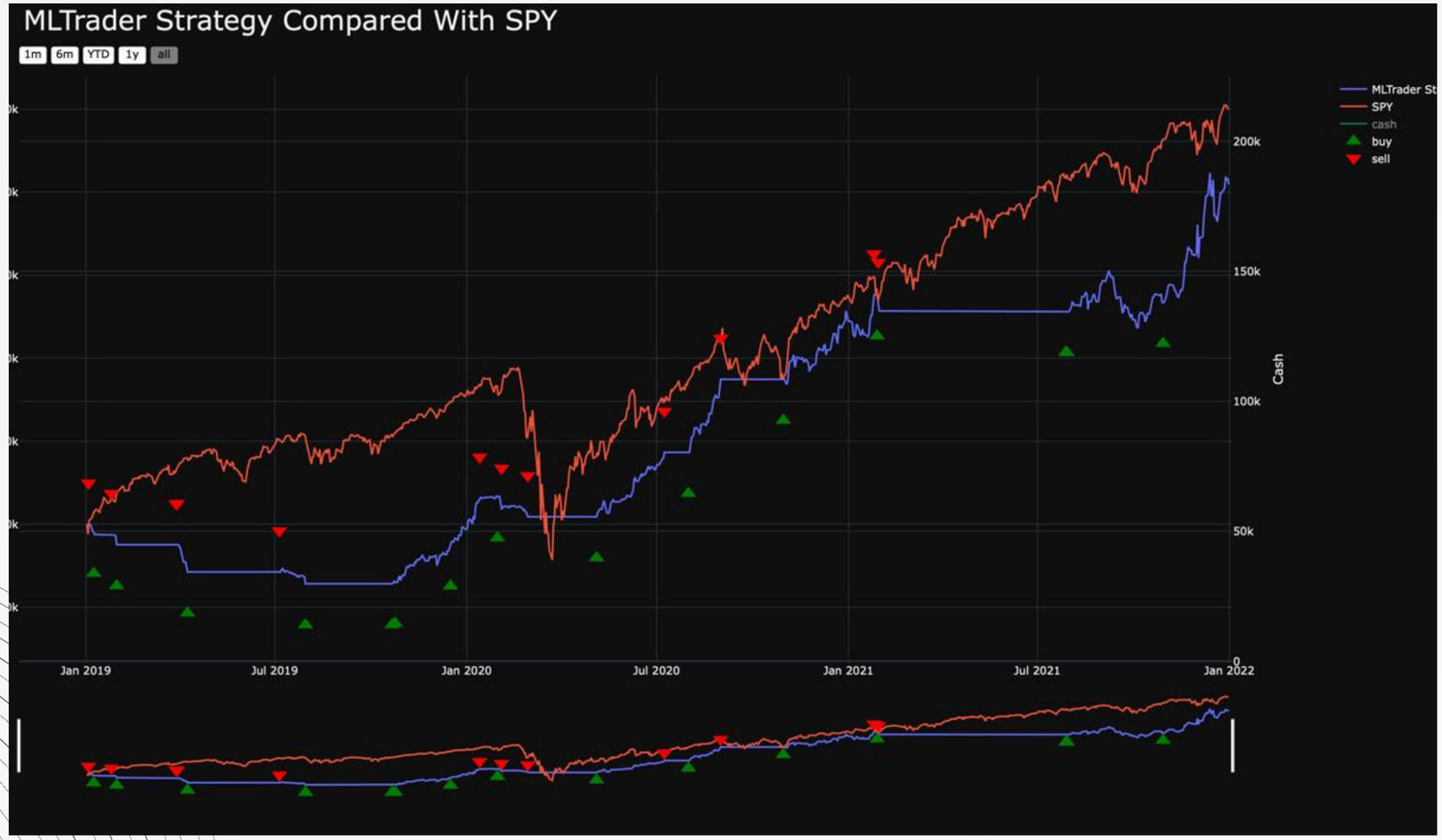
Maximum Drawdown:

- The maximum percentage decline from the bot's peak equity to its lowest point.

Average Trade Duration:

- Average time duration for holding positions or executing trades.

GRAPHICAL FINDINGS



This graph represents the performance of the trading bot while backtesting

FUTURE SCOPE

In Todays world , the field of trading is growing at a rapid rate and hence the requirement of a trading bot it totally justified . The uniqueness of a trading bot is defined by the logic it uses for the buy and sell of shares which can be further deveoped via machine learning

Suggested Changes

Some changes for the future scope of the project as suggested by our teachers are as follows :-

Candlestick analysis is a widely used method in trading that involves interpreting the patterns formed by candlesticks on price charts.

Candle Analytics

we have hardcoded the selling part in our trading bot in the present time .. we will apply ML on it and the bot will change the analysis itself

Hardcoded ML

Utilize techniques such as Kelly criterion, volatility targeting, or optimal f (fraction) strategies to optimize position sizing and risk management.

Position Sizing

ML IMPLEMENTATION

NLP

Natural Language Processing (NLP) Models: NLP techniques can be used to analyze news sentiment, social media data, and other textual sources to make trading decisions based on sentiment analysis

SVM

SVM is a supervised learning algorithm used for classification and regression tasks.
I t works by f inding the optimal hyperplane that separates data points into different classes or categories.

KNN

KNN is a simple, non-parametric algorithm used for classification and regression tasks.
I t makes predictions based on the majority vote of the nearest neighbors to a given data point

CONCLUSION

To conclude this amazing project at the end , we learnt a lot about coding and how things actually work in the world of tech . This project mainly is focusing on the buy sell logic of the stocks using sentiment analysis and we are looking forward to enhance it further using machine learning and AI in order to make a real world application out of it .

Thank You