IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

Trading vice, Trading Bot for Stock

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Abstract

This research paper consists of an attempt to build a trading bot for the purpose of trading stocks in real time market autonomously. This bot can be developed only after a heavy research in the current market as we intend to take out all the short comings in existing bots available in market to make it league apart.

"Bot" is technically a short form for robots. Robots are have physical presence and are known for working and carrying out tasks without any human intervention. Similarly, on computer systems the programs we use to carry out applications autonomously are known as bots. These bot are simple scripts in any coding language and are run in systematic procedures to carry out multiple tasks and chores.

All the bots work on historical data sothat they can find reference in past for the problem they encounter in present times. In this world all the problems are repeated and run back and forth in timeline. So to minimize the human efforts on repeated tasks bots are used. Bots, save a lot of time and effort of researchers and let them carry out their researches for new problems for mankind to encounter.

Especially, for trading bots, market research and strategies are very important. In this research paper we will try to build a strategy to construct a bot after we walk you through all the market strategies and primitive techniques to build a trading bot. Let's dive deep into the detailed literature.

I. INTRODUCTION

Generally bots are targeted to do all the tasks autonomously without any human intervention. These bots are just a simple code written in any coding language which is run over in a very systematic and periodic fashion as in when required.

Bots are intended to make our life easier by eliminating all the human efforts and all the repetitive work. No problem is new; all the

problems that we face these days are recorded in history or have some links back in the time. This is the main reason to use bots, as all the problems can be encountered properly with reference to past and researchers can work on new problems.

Trading Vice is a product under development, currently in literature and strategy orientation phase. Trading Vice focuses eliminating marginal time errors which occur on manual operations to curb all the rate changes that happen in that latency period.

Additionally, Trading Vice helps all the traders to simultaneously work charts and aid them while putting their orders irrespective of the quantity autonomously when a desired price hits the market. Trading bots can really be very helpful and can be taken into use for backtracking historical data for better trading analysis.

Current market is very volatile and predictions recession is getting stronger day by day. A good trader is king of both bad and good times. A product like trading vice can really be a great help for the ones who want bag maximum profits. This product is majorly targeted towards day traders and swing traders.

II. Market Analysis

Let's first learn basic things about market, current situations and some strategies to understand gist of it otherwise this subject is another research paper all together. Particularly when we talk about any market now onwards in this research paper, we will be refereeing to the Indian markets especially NSE, Nifty50 and Bank Nifty. These markets are very volatile since past quarter and people are able to bag good trades.

Bank Nifty and Nifty 50 did hit their all time high for this season and recorded some good trades as well. With major volatility amount of buyers and suppliers increases significantly in these markets and high volumes are traded.

A lot of indicators and studies are used to predict market situation in order to bag good trades in specific time frame. Market is also prone on repeating historic trends and with knowledge of history in markets one can really take advantage of stock markets.

Multiple companies are formed everyday and prepare to be listed on Indian stock market list. Share rates of each company depend upon multiple factors such as financial and technical aspects of the company. These factors are the sole reason for market and price fluctuations.

Markets are volatile these days and with great prediction of recession all the traders will be in a rush to bag good trades everyday and want to make as much money as possible.

III. Trading Strategies

Relevant to our use we need to know some basic terminologies only. These terminologies will be function of our bot to perform in real time. Sell order- This means whenever we want to sell a share or a stock of any company for a certain price we put in a sell order.

Buy order- This means whenever we want to buy any share or a stock of any company for a certain price we put a buy order.

Stop loss- This is the amount below or above which we will exit the trade if we are incurring any loss in the trade. Scenarios are different for both selling andbuying options.

Trigger Point/ Target- This is the desired amount where we limit and exit our trade after making desired profit. Scenarios are different for both selling and buying options.

Short Sell- First we sell the stock and buy it afterwards.

These terminologies are enough for us start working on our bot trading vice. Prior to that we just need to understand how market works in brief.

In market there are buys on one end and sellers on the other. On one end there is always a buyer to buy and a seller to sell from the other end. If a buyer wants to buy some share for a certain point then similarly there should be a seller too selling at the

same share at same price. This is how the trading markets work. They make buyers and sellers meet under one roof and carry out the trade business.

IV. Trading Vice

This is the main product of this whole research paper. Trading Vice is a trading assistant, particularly a bot, working on a python a script for all the procedural implementation to make it work for the traders.

Trading Vice even tends to offer an interactive UI for all the users who find it difficult for use old command prompts and commands. This feature is kept in the arsenal for later upgrade, after the bot finished and is functional.

Trading Vice's main feature is to make people execute trades effortlessly and autonomously once all the information is feed in like quantity, stop loss, target, etc. This bot's main work will be around selling and buying of stock for the required quantity and market configurations as set by the user.

Once the market configurations are fed in, its work is to facilitate all the trades with high accuracy and no time lag. Once the button is pressed it should buy or sell on that particular moment only. When a trader can automate all the trades for the day then he/she has a lot of time to research in market domain to pick better trades in future.

Apart from it trading vice can provide history on market data and important insights relevant to that data to use for future prospects. Moreover we intent to release our product on Forex and Crypto platforms as well to expand the user base and to fetch data on user behaviour, retention, usage and feedback to improve our product.

Our product is an application of artificial intelligence and with further advancements we would also want it to be a good by-product of machine learning as it is clearly evident from our future goals with this bot.

V. Creating the Python Trading Bot

The most basic thing we require to do this that we need stable internet connection and a computer and then require MetaTrader 4 (MT4) which is an electronic trading platform required to build all the coding and market strategies as it uses the Meta Quotes Language 4, MQL 4.

To create a trading bot on python, there are many approaches which can be opted but we will use the ideology of exponential moving averages or we can also use crossing over of two exponential moving averages to get precise and precision oriented results.

Hence when short term moving averages crosses over long term moving averages, it provides a signal to buy. On the other hand when short term moving averages crosses bellow the long term moving averages, it provides a signal to sell. These indicators are crucial for bot working and prediction.

Now the main strategy is build around the two exponential moving averages with one at 20 and other at 50 candles look back period. Right now the bot is trades with 6 hours look back accumulated data and the has the wallet allowance of 50% for the amount deposited online on the web broker's wallet for trading live.

VI. Getting Started

First of all, any schedule decorator is made to run on a particular time frame and so on to receive the symbol data. Particularly in the industry, they are profoundly known as handlers but one can call then anything they want.

The second argument we put in will always have the name of the share to be traded and the time frame. This argument is popularly associated with factual provision of data providence and for the same it is referred as simply “data”.

Now for building a strong algorithm around the incurred knowledge, we need to define a least two exponential moving averages. The first one we can define for short moving averages at a markup level of 20 and the longer moving average at a markup

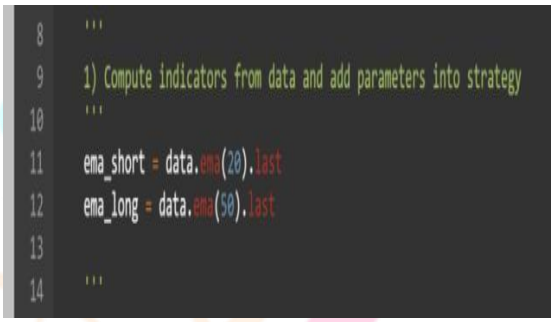
level of 50 candlesticks.

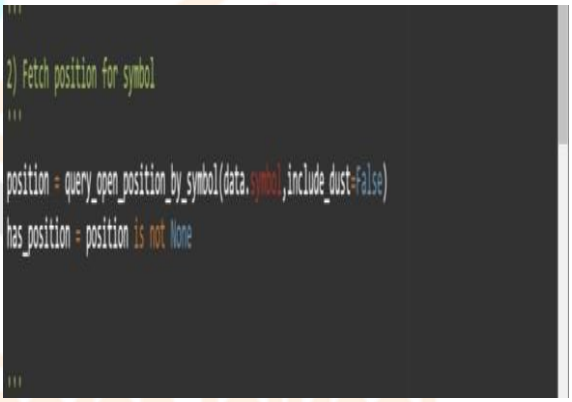
```
def initialize(state):
    pass

@schedule(interval="6h", symbol="TATA")
def handler(state, data):


    '''
    1) Compute indicators from data and add parameters into strategy
    '''
    ema_short = data.ema(20).last
    ema_long = data.ema(50).last

    '''
    2) Fetch position for symbol
    '''
    position = query_open_position_by_symbol(data.symbol,include_dust=False)
    has_position = position is not None
```

Now we need to know if we have any open position for our respective symbol, for eg- Tata, Mahindra, etc. By calling a Boolean function we can get to know this easily in the form of true and false. This also gives us some insights on market status and situation currently going on.

To manage sell and buy orders first we need to connect out bot on the online broker where we intend to trade with the help of an API or CDN. One the connection is established then our bot looks on to the exponential moving averages. If the short moving average cuts the longer one from above then we but a buy order.

Similarly when the short moving average cuts the longer one from the below then we put a sell order. At one go we only allow 50% of the wallet for the trade. Right now we have got a very small code for initial basis for testing purposes and for looking out all the loop holes in the build process.





```python
main.py
    '''
    ema_short = data.ema(20).last
    ema_long = data.ema(50).last

    '''
    2) Fetch position for symbol
    '''
    position = query_open_position_by_symbol(data.symbol,include_dust=False)
    has_position = position is not None


    '''
    4) Resolve buy or sell signals
    '''
    if ema_short > ema_long and not has_position:
        order_market_target(symbol=data.symbol, target_percent=0.8)

    elif ema_short < ema_long and has_position:
        close_position(data.symbol)
```

VII. BackTesting on Historical Data

This is a smaller version required for back testing and for working historical data. In later stages we intend to build our bot with other strategies too to compare all the variable methods. We also intend to grown strategies on RSI, MACD, Bollinger Bands, etc to look upon the variable results.

Moving with back testing of our bot on historical data we intend to measure an accuracy of around 80% for now depending upon the market configuration fed in. We calculate this precision manually as of now by making note of number of trades made and marking all the glitches and the trades with low accuracy to bag a good cash return. This precision calculation provides us with the accuracy of the bot and helps us to understand all the error improvement required on technology part and as wellon the trading strategy end.

VIII. Optimization

After back testing and accuracy calculation, only one thing is majorly required, to optimize the code. Optimization basically is to render the code and look for all the small mistakes and error due to which glitches andlatency can occur which could affect the overall working of the bot.

With optimization we intend to introduce various parameters with the help of “params” for minimizing the code lines and working on small bits of words for faster computation. We basically add these parameters to indicators as we are fetching these details and want to work convert object to functions for faster processing and multiple call backs.

IX. Conclusion

Here we just not conclude our project, we intend to our bot with incoming technology and study material for better and improved operations. We intend to build our bot with features league apart and for that we extend our study to new possible horizons. At this stand point our bot is cable of taking trades but we still are on with the testing phase to rule all minor anomalies. For all the coders this task is no big deal but yes requires a lot of knowledge and implementations to compute all the basic requirements expected from a trading bot.

Trading Vice is rich conceptually like a bot should be in the starting phases. Secondly, trading vice holds strong technical background and hence will grow when it will be implemented in mainstreams. As of now trading bot is really useful for technical analysis on historical data andfor daily use.

X. Future Scope

By the end April 2023 Trading Vice will be in full bloom. As we are developing this bot in Python we intend to grow this bot on Machine Learning side as well. We want it to draw insights from the historical data as the trends in trading world repeat with time. Adding on we want to provide a user interface as well for the people who find it difficult working with coding environment after downloading the bot for making market configurations.

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