isrjournals

International Journal of Advanced Research in Computer Science Engineering and Information Technology

Volume: 6, Issue: 3,Special Issue: 2 ,Jun,2022 ,ISSN_NO: 2321-3337

STOCK PRICE PREDICTION USING MACHINE LEARNING

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ABSTRACT - *Machine learning is effectively implemented in forecasting stock prices. The objective is to predict the stock prices (Apple, Microsoft, Google, and Amazon) in order to make more informed and accurate investment decisions. We propose a stock price prediction system that integrates mathematical functions, machine learning, and other external factors for the purpose of achieving better stock prediction accuracy and issuing profitable trades. There are two types of stocks. You may know of intraday trading by the commonly used term "day trading." Interlay traders hold securities positions from at least one day to the next and often for several days to weeks or months. Sentiments intensity are very powerful in sequence prediction problems because they're able to store past information. This is important in our case because the previous price of a stock is crucial in predicting its future price. While predicting the actual price of a stock is an uphill climb, we can build a model that will predict whether the price will go up or down*

Keywords – Stock Price Prediction, Machine Learning, Linear Discrement Analysis

1, INTRODUCTION

Predicting how the stock market will perform is one of the most difficult things to do. There are so many factors involved in the prediction – physical factors vs. psychological, rational and irrational behaviour, etc. All these aspects combine to make share prices (Apple, Microsoft, Google, and Amazon) volatile and very difficult to predict with a high degree of accuracy.

The financial market is a dynamic and composite system where people can buy and sell currencies, stocks, equities and derivatives over virtual platforms supported by brokers. The stock market allows investors to own shares of public companies through trading either by exchange or over the counter markets. This market has given investors the chance of gaining money and having a prosperous life through investing small initial amounts of money, low risk compared to the risk of opening new business or the need of high salary career.

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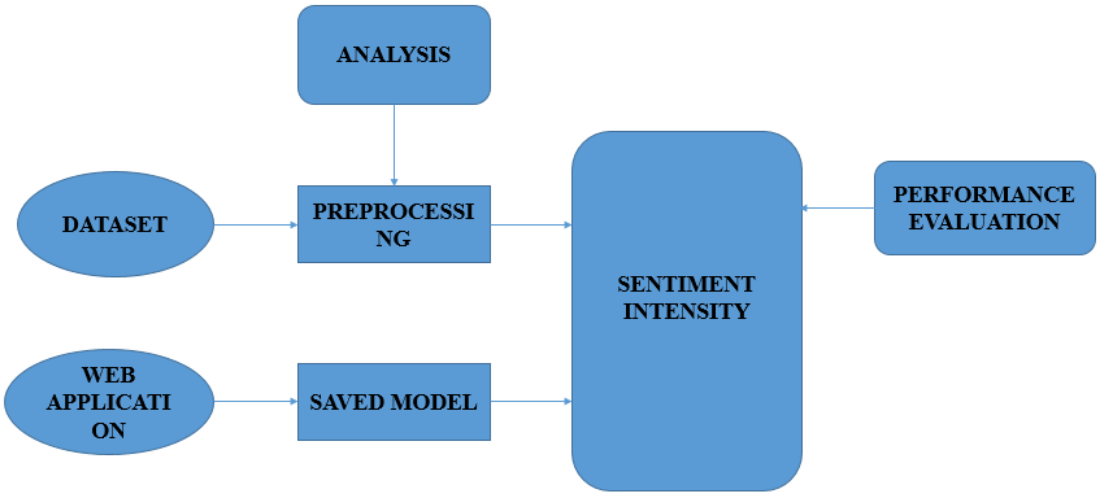
Stock markets are affected by many factors causing the uncertainty and high volatility in the market. Although humans can take orders and submit them to the market, automated trading systems (ATS) that are operated by the implementation of computer programs can perform better and with higher momentum in submitting orders than any human.

However, to evaluate and control the performance of ATSs, the implementation of risk strategies and safety measures applied based on human judgments are required. Many factors are incorporated and considered when developing an ATS, for instance, trading strategy to be adopted, complex mathematical functions that reflect the state of a specific stock, machine learning algorithms that enable the prediction of the future stock value, and specific news related to the stock being analysed.

2, OVERVIEW OF EXITING WORK

A system architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system.



Dataset: A data set is a collection of related, discrete items of related data that may be accessed individually or in combination or managed as a whole entity. A data set is organized into some type of data structure.

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Web Application: A web application is application software that runs on a web browser, unlike software programs that run locally and natively on the operating system of the device. Web applications are delivered on the World Wide Web to users with an active network connection**.**

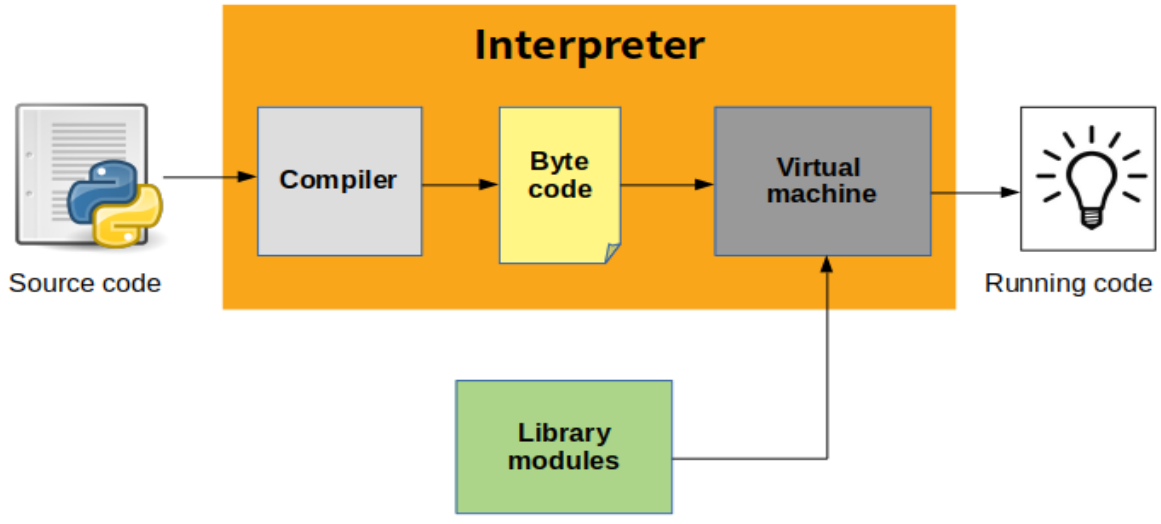
Analysis: A detailed examination of anything complex in order to understand its nature or to determine its essential features a thorough study.

Pre-processing: pre-processing can refer to manipulation or dropping of data before it is used in order to ensure or enhance performance, and is an important step in the data mining process. The phrase "garbage in, garbage out" is particularly applicable to data mining and machine learning projects.

Saved Model: A Saved Model contains a complete Tensor Flow program, including trained parameters and computation. It does not require the original model building code to run, which makes it useful for sharing or deploying with TF Lite, Tensor Flow.js, Tensor Flow Serving, or Tensor Flow Hub.

Performance Evaluation: Performance Evaluation is defined as a formal and productive procedure to measure an employee's work and results based on their job responsibilities.

2,1 PROPOSED WORKFLOW



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The platform module in Python is used to access the underlying platform's data, such as, hardware, operating system, and interpreter version information. The platform module includes tools to see the platform's hardware, operating system, and interpreter version information where the program is running.

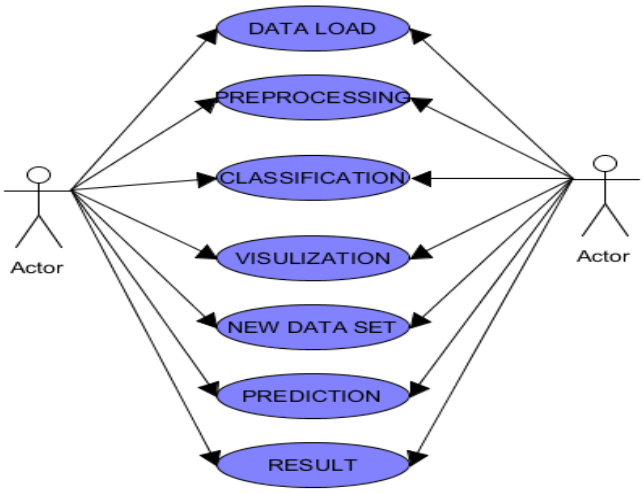
There are four functions for getting information about the current Python interpreter. python_ version() and python_ version _tuple() return different forms of the interpreter version with major, minor, and patch level components. python_ compiler() reports on the compiler used to build the interpreter. And python_ build () gives a version string for the build of the interpreter.

Platform () returns string containing a general purpose platform identifier. The function accepts two optional Boolean arguments. If aliased is true, the names in the return value are converted from a formal name to their more common form. When terse is true, returns a minimal value with some parts dropped.

2.2 USE CASE DIAGRAM

A use case diagram in the Unified Modelling Language (UML) is a type of behavioural diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted.

CLASS DIAGRAM



3, SYSTEM ANALYSIS

3.1 Existing System

- The prediction of a stock using Machine Learning. The technical and fundamental or the time series analysis is used by the most of the stockbrokers while making the stock predictions.
- The programming language is used to predict the stock market using machine learning is Python. we propose a Machine Learning (ML) approach that will be trained from the available stocks data and gain intelligence and then uses the acquired knowledge for an accurate prediction.

4, MAIN FEATURES OF TRANSPOSE – MINIFY FRAMEWORK

PRODUCTIVITY AND SPEED

It is a widespread theory within development circles that developing Python applications is approximately up to 10 times faster than developing the same application in Java or C/C++. The impressive benefit in terms of time saving can be explained by the clean object-oriented design, enhanced process control capabilities, and strong integration and text processing capacities. Moreover, its own unit testing framework contributes substantially to its speed and productivity.

PYTHON IS POPULAR FOR WEB APPS

Web development shows no signs of slowing down, so technologies for rapid and productive web development still prevail within the market. Along with JavaScript and Ruby, Python, with its most popular web framework Django, has great support for building web apps and is rather popular within the web development community.

OPEN-SOURCE AND FRIENDLY COMMUNITY

As stated on the official website, it is developed under an OSI-approved open source license, making it freely usable and distributable. Additionally, the development is driven by the community, actively participating and organizing conference, meet-ups, hackathons, etc. fostering friendliness and knowledge-sharing.

PYTHON IS QUICK TO LEARN

It is said that the language is relatively simple so you can get pretty quick results without actually wasting too much time on constant improvements and digging into the complex engineering insights of the technology. Even though Python programmers are really in high demand these days, its friendliness and attractiveness only help to increase number of those eager to master this programming language.

5. DATASET, IMPLEMENTATION

5.1 DATASET DETAIL

The dataset for the Four Companies Google, Microsoft, Amazon, Apple has included in the following Link

1.https://finance.yahoo.com

5.2 TOOLS AND TECHNOLOGY

- **Python:** Python was the language of selection for this project. This was a straightforward call for many reasons.
    1. Python as a language has a vast community behind it. Any problems which may be faced is simply resolved with a visit to Stack Overflow. Python is among the foremost standard language on the positioning that makes it very likely there will be straight answer to any question
    2. Python has an abundance of powerful tools prepared for scientific computing Packages like NumPy, Pandas and SciPy area unit freely available and well documented. Packages like these will dramatically scale back, and change the code required to write a given program .This makes iteration fast.
    3. Python as a language is forgiving and permits for program that appear as if pseudo code. This can be helpful once pseudo code given in tutorial papers must be enforced and tested. Using python this step is sometimes fairly trivial. However, Python is not without its errors. The language is dynamically written and packages are area unit infamous for Duck writing. This may be frustrating once a package technique returns one thing that, for instance, looks like an array instead of being an actual array.

5.3 IMPLEMENTATIONS

5.3.1 Reference implementation

C-Python is the reference implementation of Python. It is written in C, meeting the C89 standard with several select C99 features. It compiles Python programs into an intermediate bytecode which is then executed by its virtual machine. C-Python is distributed with a large standard library written in a mixture of C and native Python. It is available for many platforms, including Windows and most modern Unix-like systems. Platform portability was one of its earliest priorities.

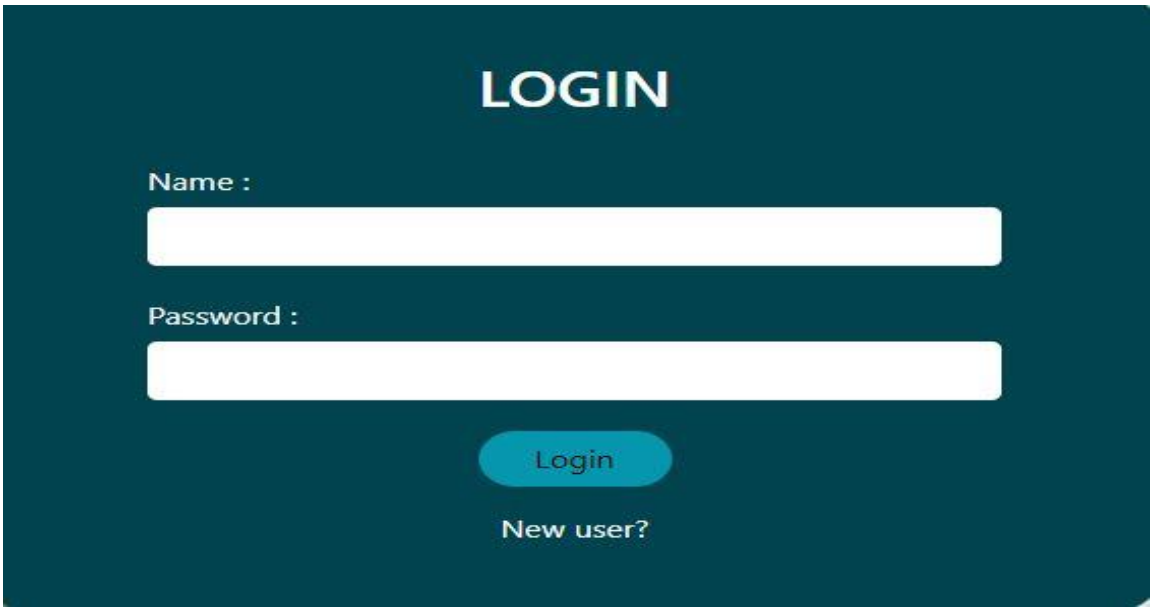
5.3.2 Other implementations

Python is a fast, compliant interpreter of Python 2.7 and 3.5. Its just-in-time compiler brings a significant speed improvement over C-Python but several libraries written in C cannot be used with it.

Stack less Python is a significant fork of C-Python that implements micro threads; it does not use the C memory stack, thus allowing massively concurrent programs. Py Py also has a stack less version Micro Python and Circuit Python are Python 3 variants optimized for microcontrollers. This includes Lego Mind storms EV3.

6.RESULT

6.1 CREATING LOCAL HOST



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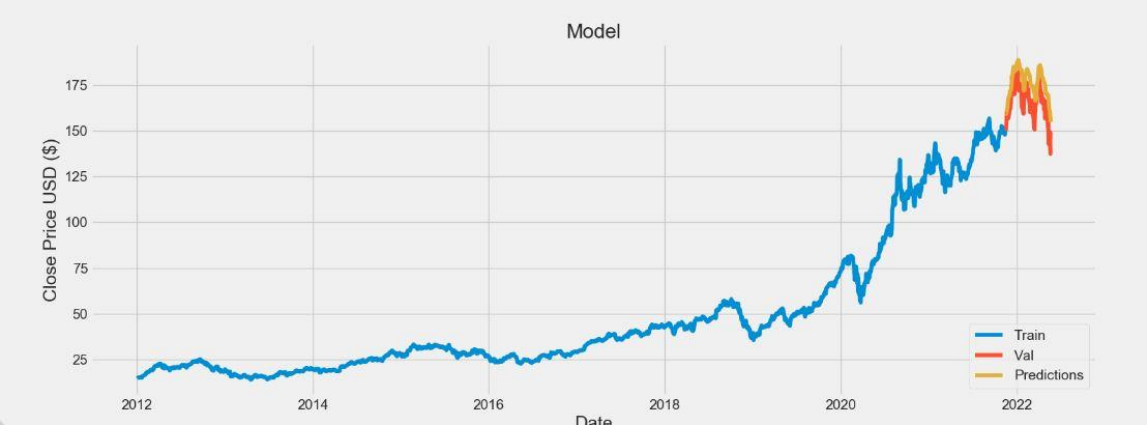
6.2 OUTPUT



6.3 PREDICTION FOR FUTURE 5 DAYS

	AAPL	GOOG	MSFT	AMZN
14	129.738770	2527.040039	257.785065	169.193497
15	128.903534	2520.659912	256.267426	169.156494
16	129.410660	2513.929932	255.295364	170.762497
17	131.041321	2527.419922	258.786865	174.462006
18	129.718903	2511.350098	257.328766	174.345001

7. CONCLUSION

In this project, we are predicting closing stock price of any given organization, we developed a web application for predicting close stock price using sentiments intensity and linear discriment algorithms for prediction. We have applied datasets belonging to Google, Apple, Microsoft and Amazon Stocks and achieved above 95% accuracy for these datasets.

8. FUTURE SCOPE

Future scope of this project will involve adding more parameters and factors like the financial ratios, multiple instances, etc. The more the parameters are taken into account more will be the accuracy. The algorithms can also be applied for analyzing the contents of public comments and thus determine patterns/relationships between the customer and the corporate employee. The use of traditional algorithms and data mining techniques can also help predict the corporation performance structure as a whole..

In the future, we plan to integrate neural network with some other techniques such as genetic algorithm or fuzzy logic. Genetic algorithm can be used to identify optimal network architecture and training parameters. Fuzzy logic provides the ability to account for some uncertainty produced by the neural network predictions. Their uses in conjunction with neural network could provide an improvement for stock market prediction.

9. REFERENCE

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