STOCKS PRICE PREDICTION USING MACHINE LEARNING

An Industry Oriented Mini Project Report Submitted to

Jawaharlal Nehru Technological University Hyderabad

In partial fulfillment of the requirements for the award of the degree of

BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND ENGINEERING

BY

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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Certificate

*This is to certify that the Industry Oriented Mini Project Work entitled "***STOCKS PRICE PREDICTION USING MACHINE LEARNING"** *is the* Bonafide *work done*

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Viva-Voce held on……

Internal Examiner **External Examiner**

Vision of the Institution

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Mission of the Institution

Our mission is to impart education, in a conducive ambience, as comprehensive as possible, with the support of all the modern technologies and make the students acquire the ability and passion to work wisely, creatively and effectively for the betterment of our society.

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Serving the high-quality educational needs of local and rural students within the core areas of Computer Science and Engineering and Information Technology through a rigorous curriculum of theory, research and collaboration with other disciplines that is distinguished by its impact on academia, industry and society.

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The Computer Science and Engineering program provides students with an in depth education in the conceptual foundations of computer science and in complex hardware and software systems. It allows them to explore the connections between computer science and a variety of other disciplines in engineering and outside. Combined with a strong education in mathematics, science, and the liberal arts it prepares students to be leaders in computer science practice, applications to other disciplines and research.

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The graduates of the program will have skills to develop products, offer services and create new knowledge.

Program Educational Objective 4: (PEO4)

The graduates of the program will have fundamental awareness of Industry processes, tools and technologies.

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PO1:	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2:	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3:	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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PO8:	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9:	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10:	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11:	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12:	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1:	**Foundation of mathematical concepts:** To use mathematical methodologies to crack problem using suitable mathematical analysis, data structure and suitable algorithm.
PSO2:	**Foundation of Computer System:** The ability to interpret the fundamental concepts and methodology of computer systems. Students can understand the functionality of hardware and software aspects of computer systems.
PSO3:	**Foundations of Software development:** The ability to grasp the software development lifecycle and methodologies of software systems. Possess competent skills and knowledge of software design process. Familiarity and practical proficiency with a broad area of programming concepts and provide new ideas and innovations towards Research.

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QUALITY OF THE PROJECT

I. Consideration to Factors

Factors *(Environment, Safety, Ethics, Cost)*	Type of Project *(Application, Product, Research, Review, etc.)*	Standards
This project has a high Impact of Safety and is feasible.	This project is a research based project and is applicable in improving safety on social media.	The type of the project is based on application and its standards. The standard of this project is midrange.

II. POs and PSOs addressed through the project with justification

S. No.	POs and PSOs addressed	Justification
1.	PO1	**Engineering Knowledge:** we have applied the Machine Learning techniques to solve the problem.
2.	PO2	**Problem analysis:** We have analyzed the problem of moving average problem in Stocks Price Prediction.
3.	PO3	**Design/Development of solutions:** we designed a solution which counters the moving average problem in stocks prediction.
4.	PO4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5.	PO5	**Modern tool usage:** We selected and applied the appropriate ML techniques,modern engineering and IT tools.
6.	PO6	**The Engineer and Society:** This Project context is to improve the accuracy of stocks price prediction which helps in young investors to invest their money in stocks.
7.	PO8	**Ethics:** Apply ethical principles and commit to professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8.	PO9	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary environment.

S. No.	POs and PSOs addressed	Justification
9.	PO11	**Project Management and Finance:** Demonstrate knowledge and understanding of the engineering community, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
10.	PO12	**Lifelong Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
11.	POS1	**Foundation of Mathematical concepts:** To use mathematical methodologies to crack problem using suitable algorithm.
12.	PSO2	**Foundation of Computer System:** The ability to interpret the fundamental concepts and methodology of computer systems. Students can understand the functionality of hardware and software aspects of computer systems.
13.	PSO3	**Foundations of Software development:** The ability to grasp the software development lifecycle and methodologies of software systems. Possess competent skills and knowledge of software design process. Familiarity and practical proficiency with a broad area of programming concepts and provide new ideas and innovations towards research.

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We place highest regards to our Parent, our Friends and Well-wishers who helped a lot in making the report of this project.

DECLARATION

We hereby declare that this Industry Oriented Mini Project Work is titled **"STOCKS PRICE PREDICTION USING MACHINE LEARNING"** is a genuine project carried out by us, in **B. Tech (Computer Science and Engineering)** degree course of **Jawaharlal Nehru Technology** other course or university for the award of my degree by us.

Date:

Candidate Name(s)	Roll Number	Signature
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ABSTRACT

Stocks are an unpredictable curve. Stock market predictions are covered with complexity and uncertainty. The main goal of persuasion is to predict the stability of future market actions. Many researchers have done their research on the movement of future market developments. The power supply is made up of volatile data making data an indispensable source of efficiency. Impact the same chances on the effectiveness of the prediction. In the recent trend in market prediction technology, machine learning has become part of the picture for the implementation and prediction of training sets and data models. Machine learning uses different predictive models and algorithms to predict and automate needs. This Project focuses on using regression and LSTM to predict stock value problem.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

1.1 INFORMATION ON STOCK

This work has all heard the word stock in some way. In particular, stocks are societies and companies that are commercialized and aim to establish a position in the marketing world. Another name for a stock is a stock that is widely used in daily life. The term is an investment plan and is considered a long-term investment that secures and provides sufficient funds at retirement age.

Buying a company's stock means buying only a small part of it. People invest in the same for long-term profits, which they now consider to be of low value, but can grow over time. It is an investment that is guaranteed in the long run and covers the long term with fair goals. The value of the stock you invest in today must give you the best returns tomorrow, but it's not the same.

The market is unpredictable, as are the resources and factors needed to turn it off or on in a set. It has never been at the same level and the same pattern is still unpredictable up to this point. Several approximations and prediction methods have been inferred, and the approximations and rough numbers have been generated with the expectation of the best, but all resources are unreliable and still unpredictable.

Knowing and investigating market conditions is the best way to find credibility with many brokers who have made the same profession and made a lot of money with it. They make predictions and advice, but consulting costs and fees are high and stock valuations are never the same. The market is changing at an alarming rate. There are many ups and downs in the market even in one day, apart from the resources and timing of external and internal agents. Stocks are an attractive resource in the first place.

In other terms, a stock is defined as a fair share or representation of ownership that describes security measures and the agreement between the two parties, the individual and the company. Stocks is just a word of imagination, as it exists from the beginning and tends towards uncertainty. Those who study it and practice it every day have made a lot of money with it. There are several different agents out there to help you understand and invest in them, and the fees for doing so are busy and insanely expensive.

The most important resource for a company is the funding to do its day-to-day work and then make a profit. Existence and ownership are busy, banks are vultures with higher interest rates, when higher budget estimates are needed and the resources, they need to raise funds and get loan loans for approval are overgrown. Is another form of investment that limits product margins. Equities are another way for companies to generate income, increase production for the highest income, and get the most out of their business plans to get the big picture. This has proven to be an effective way to invest and grow in the commercial arena and a better alternative to tackling the financial crisis during the requirements period. Investing savings in the hope that investors will regain returns in the form of higher returns is a risk phenomenon[2].

As the valuation of the same increases, the valuation and price of the stocks rises, which produces the economic benefits of both parties. In fact, it is considered a small problem in Indian society and people believe it is a godsend.

When a person buys stock in a company, they are known as shareholders and receive a share of what they have invested in or their profits. Investors can buy and sell stocks according to their needs. The company has many stock brokers who play with them, so they can give their stock to their own people or others.

1.2 PROBLEM DEFINITION

When a person buys stock in a company, they are known as shareholders and receive a share of what they have invested in or their profits. Investors can buy and sell stocks according to their needs. The company has many stock brokers who play with them, so they can give their stock to their own people or others.

The stock is an unpredictable curve that has been in the picture ever since. Its nature had always been long and accommodating. It had grown in popularity over time. People are more fascinating and interested in the same thing than before. Same for the case. for the organization. The organization had made it a better source of income instead of investing and getting approval for a loan from the bank. From a business perspective, this is a more efficient and less hectic way to go.

Stock is unpredictable and has remained the same from the start, its way of scaling and decalcifying was a phenomenon and the experience is the best part of it, it has its advantage and flexibility with the changes it has of the rise as well as the collapse of the whole Market. It's easy to define in a few words, but creating and understanding an essence is much more hectic and time-consuming. The simpler it sounds; the complex is its phenomenon and its integrator. It has all of its different dependencies and the integration of different agents that fluctuate equally in the market. Finding a precision and getting the exact values of it is not yet aligned and no particular model of it can be seen in the market value.

Finding the closest one and getting an accurate approximation of such unpredictability is a problem in itself. It is difficult to combine the data to get the best efficiency improvement forecast along with considering the moderator's different expectations, and this project consider the same thing. and implemented with all aspects to get the best of the same and to achieve a result that can be better interrupted and the efficiency remains the same, with the value of the various aspects, to achieve an effect of reducing the risk and using it during the Affect the period in order to get the most of it. This is completely based on the machine learning algorithm to proceed and deliver an effective result. Receiving and processing the data and making a forecast for three days is the approach to the problem this project is working on.

1.3 PROBLEM PURPOSE

Stock marketplace prediction is a prediction gadget software program that remove darkness from the risk that undergoes at some stage in the funding in inventory marketplace. It predicts the inventory costs and its fee of change acknowledging the primary information and the statistical evaluation in the front of users.

Data is taken into consideration because the virtual gasoline that offers the opportunities of better yearn and offers the imminent terms. Knowledge is strength and equal holds accurate with the inventory. Stock is unpredictable and over-converting its dynamic in nature. The upward thrust and fall of the equal is choppy and can't be labeled so easily.

Dependencies of the equal deals with bendy assets and the sellers at the back of it. Investment at some stage in an economic day determines the hole inventory marketplace for the next day. It has its dependencies and is total integration with the level of finances and sales era. The inventory is amazing and annoying in nature. The primary subject of the challenge is to expect the turning curves and convey the predictability approach and go through the procedure and algorithms to finish to a feasible useful resource supply.[2] Everything flows a sample. Pattern is the manner of derivation and so holds genuine for the inventory too. Stock in daily existence follows a sample movement. Increase in a few useful resources can boom the charge of a few whiles lower the charge fee for the others, The supply and the final results are derived at the polarity foundation that can both be positive, impartial or a bad flow.

Correlation of the given polarity is decided and a powerful supply and reliability is established. This challenge facilitates in bridging the assets and empowering the human beings to know and alternate the maximum out of inventory and recognize the era and the vulnerabilities that needs to be visible and predicted. The enhancement of the equal is finished with the useful resource graph which makes a consumer or the consumer to analyses the equal and take the wishes and essential info earlier than dealing and remember the ones matters for the yield that the man or woman is inclined to make investments on.

Forecasting of the inventory prediction is finished via way of means of the available data supply and the prediction is finished for the upcoming week. The predictability itself is a task and that's the principle cause of the report.

1.4 PROJECT FEATURES

Features offers with the flexibilities and the pinnacle marks that you can present. The challenge became headed with the aid available and the maximum that the company needs and this is finance. Taking approximately finance and getting to know at the equal gave a concept at the financial and stocks. So, the presenting of the concept got here with dealing with and automating the aid which different sellers are making fortune out of it. Knowledge is a bliss and getting to know is the curiosity whereas final results is the expectation so the aid offers with the importation and extraction of multiple machines getting to know algorithms to learn, process and yield the end result to derive and finish likely final results set this is powerful and generative in nature. There are various models that outflows in marketplace which are trying it's best on growing a aid and provide the predictability to maximum of it correct however the entirety is now no longer the equal and the realization of the equal aren't ideal. The performance varies as the variant withinside the inventory marketplace and its prediction.

The challenge became purposed with the reason sole to make and go through the following manner of computing. The first offers with the records extraction this is carried out with clearing of records and its chunks from the database or the dataset. The 2d float is the education from the supply education is carried out and classified.

During the equal supervision is carried out and the final component is the era of the yield which presents the end result after computation of the equal. Salient functions covered are the Visualization and the prediction that offers a boost. Uses of various forecasting set of rules to forecast that holds genuine and are suffice in nature to yield to the fine aid supply. Diving and initializing the expects that wishes to be considered.

Mitigating the hazard elements to bridge and uplift the investment. Analyzing and making use of the equal to help the stay environment. Keep a song of revolutionary end result and its assessment on each day foundation to discover the flows and the level of integration. Automating for the thoughts and making it maximum with the aid of using the usage of viable algorithms that could go through getting to know and put into effect the updates in itself to summon the efforts that one wishes to take for the best.

1.5 MODULES DESCRIPTION

1.5.1 DATA SET

This is the essential module earlier than beginning of the project. The dataset is a group of facts which can be mended collectively to expose the facts versions in a time span to undergo similarly estimation and the supply of the sources and its final results for the later time of evaluation. It generates the result optimization and gives a feasible time period to customize and get the float to the derivation.

This will increase and are used withinside the degree of studies and locating the first-rate suitable aid out of the identical the sources must be finely envisioned and derived for the first-rate possible final results and the finest the value become the better is the degree of extraction and closure is the first-rate yield values that wishes to be considered.

1.5.2 DATA ABSTRACTION

Abstraction is the locating of the useful resource to its fine to classified the above dataset and gaining knowledge of the fine out of it. Abstraction of the facts is the crucial element to the flow. All the facts are a big set of chunks which on processing can limitize the yield end result and the computational suggest too. Thus, with the to be had sources the facts yield needed to be derivative. Abstraction of the dataset is to customize the facts set and locating the fine suitable constraints to think about and the undesirable sources are the selloff which could be dumped and the superb cluster is created with the precious constrains and a sample is wanted to be derived from the identical.

Data are cleared in this stage for the start of the manner. The precious facts are the set that brings the price to the facts set for a higher information and giving a higher yield and manufacturing via way of means of comparing the identical. This is a characteristic abstraction module to extract the proposing of the dataset. This is a characteristic version manner wherein all of the viable sources are classified and the identical will be in use for the proposing.

1.5.3 TRAINING DATASET

After the abstraction of the facts and clustering of the identical. The gadget needed to be educated for which the schooling facts performs the essential role. There are hundreds of gadget mastering algorithms which might be into location and evolving with the identical. The nice to the exercise of gadget mastering is to yield the end result and the content material to derive what's wished with the time frame.

This is a supervised mastering shape in which the enter are surpassed in order that the system learns from the identical. Various variations of inputs are surpassed which have been saved in the dataset. Every useful resource is taken into consideration and brought into consideration. After thinking about the complete set of facts and the useful resource the gadget attempts to research from the surpassed dataset.

The dataset must be huge and versatile. After thinking about the mastering, it attempts to combine with the identical kind and glide like similar to the human thoughts and creates a sample and the hyperlinks among the identical.

1.5.4 TEST DATASET

These are the units of records that offers the end result after gaining knowledge of from the records. This is the take a look at technology with the output end result. Results are generated in every segment of trying out. This is likewise termed because the trying out segment. Now a brand new set of datasets are passed which are deliberately like the education dataset and the performance of the identical is calculated. Over-Fitting of the dataset. Validation of the identical with the powerful constraints and hyper parameters are checked. This segment is education and the output is evaluated with the set of education.

After every method of computation, the set of records are trained and performance of the identical is measured and is evaluated with the others. Various batches of the take a look at is carried out to get to the extent of accuracy and derive end result to fetch and yield for the best performance and to be true to the effectiveness of the records which is not biased with any constrains available. This determines the performance of the device that's should for the predictions.

1.5.5 RESULT EVALUATION

This is the primary component for any implementation of the project. Evaluation of the key point to the success. All the categorization of the paintings and the quality to know the useful resource fundaments and once more organizing the equal to test the validity and the paintings go with the drift and take a look at the output is must.

The assessment, usage and implementation undergo a numerous stage of extraction and assessment. The important subject matter is to offer and give you the output with an accuracy that may be used and implemented. From the beginning to the very last the manner is categorized, supervised and performance is taking a look at and the running is undergone.

Testing is examined and its assessment are mended. The manner undergoes the equal for numerous time and phase. Testing of the equal undergoes sequential new release for plenty greater to satisfy as much as the constituency. The feedback is to be stated and similarly paintings is performed at the equal with the implementation of the distinct aligned assets which can be included with the to be had assets and its final results.

After the assessment and customization of the equal the end result is to be potted in a seen shape and the quality shape of visibility is the graph. The Graph visualization is the quality manner of visualization that maintains the target market engaged for an extended time. Derivation of the final results is without problems reachable and interpreted and the go with the drift diagram is proven with the inventory prediction that offers a top preserve to the advent and suggests the quality stage of the content. After organizing a graph connectivity, the patron or the consumer takes time to manner the information and take that image into attention and might avail for the upcoming inventory through making an investment withinside the equal.

2. LITERATURE SURVEY

One of the critical elements to preserve the consistency is the literature survey. It's the critical steps to be accompanied withinside the improvement process. The Software Development wishes authenticity of the sources and the supply of the equal. This element allows in discovering the content that been worked on and find the utilization and the implementation of the equal in today's time.

The key element to the improvement is the economic system and the energy of the product. Once the innovation of the equal undergoes via the constructing segment the help and the useful resource glide is to be monitored and computed. This is likewise referred to as the Research segment in which all of the studies are embedded and carried out to hold the glide.

2.1 MACHINE LEARNING

One of the greatest phrases heard in these days' time is Machine Learning. Either it's at paintings or different places the device gaining knowledge of has been an integral part of today's technology. Though its evolutionalizing and growing in a fast price and development and deployment of the identical continues to be in progress.

The device gaining knowledge of itself had brought a random modification in these days worlds due to which automation is in body which turned into a mare lifestyles withinside the past. It's an aspiring term in today's time. One of the moves that all the firm are involved into. It's a main pillar for day after today main the sector to a higher destiny of evolution in which the customization and exertions paintings may be lessen to 1/2 of and the safety of the survival may be withheld to face tall for the higher usage of human mind. Keeping that during photo it's been a danger to many greater in phrases of irrespective discipline of interest.

Since Machine is taken into consideration maximum green and the extent of errors are saved at the minimal the extent of labor glide may be a piece of danger and in addition improvement at the identical may also create a hundred sitting idle in domestic growing a bigger effect on unemployment and livelihood. Which in different manner is a hazard to the society too.

The type of the identical may be indexed as follows:

2.1.1 SUPERVISED LEARNING

Supervised Learning offers with the supervision of the gadget to derive the necessity enter required. It's a mathematical version wherein the inputs and output of the equal is already recognized and it's exceeded to the gadget to get the anticipated output so that the performance is decided and that is the learning section for the gadget. Here the feeding and derivation of the equal is measured. Here the machines filter the inputs learns from the purposeful unit. Compute it and shops it into its reminiscence for similarly manner and if determined an identical sample it uses the equal and learns from it and plot an end result out of the equal.

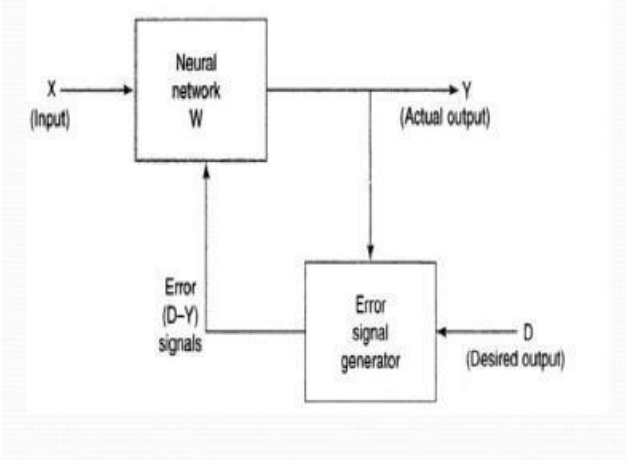

Fig 2.1 :Model of Supervised Learning

This is a based process. The gadget completely relies upon at the consumer who has to feed the inputs and has to test the performance of the equal and accurate it with the go with the drift of generation. It's an ANN network. During the education phase vectors are taken into consideration. Up withinside the above determine There's an enter vector and the output vector.

The enter vector derives and offers an output go with the drift of the output vector. If the mistake sign is generated then the generation is gone through in which as missing of the equal manner the output discipline is derived and the output end result is correct and no change wishes to be gone through for equal.

2.1.2 UNSUPERVISED LEARNING

Unsupervised getting to know offers with getting to know by itself. It is also known as self-getting to know algorithm. Here most effective the enter vector is thought and handed. So, the variance of the end result offers with the enter elements. Here the enter elements are grouped and clustered. Cluster is the primary essence of this technique.

Test Data are handed and with the generation of the identical it learns from it derives itself closer to the conclusion part. Labelling is missed in the data set , type and categorization of the identical needed to be completed the gadget itself. Cluster and Communalization is the primary essence of it.

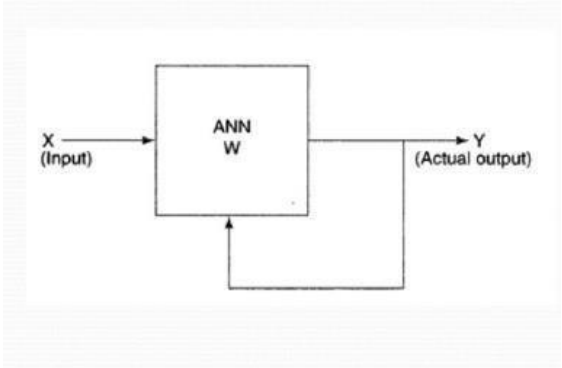

Fig 2.2 : Model of Unsupervised Learning

As described in the above figure, In this ANN network when the input is processed through the feature the output needed to be self-derived and to be matched with the cluster set to offer the end result. If the end result lacks the translation then it undergoes the iteration.

All the facts units are fashioned and mixed in a cluster set for the effective makes use of the identical in similarly cases. Feedbacks aren't reciprocated in case of such it responds to commonalities. If the commonalities are found between the dataset then it applies the previous functionalities and derive the facts. If now no longer set then it learns and identifies for the others

2.1.3 REINFORCEMENT LEARNING

In this sort of gaining knowledge of a strengthened method is used. Its offers with blooming of the knowledge. It's neither Supervised nor Unsupervised shape of gaining knowledge of. They use dynamic strategies for letting the person recognize the output and the derivation of the same. In those form of set of rules set they don't expect the environmental set.

These are even utilized in better and complicated mechanism locating likes genetic set of rules. They are extensively in development and applied maximum in automation for the higher performance of the establishment. These algorithms are utilized in Games and Automation of the car resources.

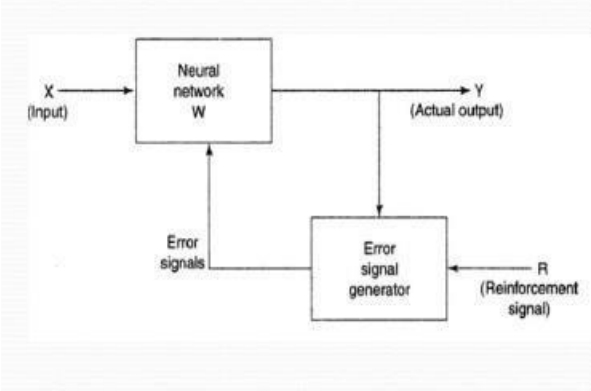

Fig 2.3 :Model of Reinforcement Learning

As defined withinside the parent the enter vector is exceeded to an ANN version wherein the functionalities of the identical are stored. If the correct output is derived then a praise is given to the person making it visit the following degree for in addition project of completion. If now no longer then the Error sign is generated for the identical.

The accuracy degree is calculated and exceeded right all the way down to the person declaring the identical. The person sees the share of fit and by skip down and attempts different keys of generation to get the maximum out of it and entire the project to hold at the ladder of success. This is the identical with the system. Machine iterates the identical and to the mistake sign an upload on of strengthened sign is exceeded which the system examines and iterates at the identical to get toward the real results.

2.2 TECHNICAL SURVEY

2.2.1 SURVEY – 1

Historical data has great value and this has been proven by Sathik and Sekhar. They derive hidden patterns of the data set and create an investment decision plan using various data mining technologies. They used the same production to invest in stocks. Its performance is 84.26%, which is considered a higher success rate[6].

2.2.2 SURVEY – 2

ANN or artificial neural network was later discovered by Liam and Jing. They used ANN techniques to classify, predict, and recognize data sets. In neural networks, brain phenomena are studied and the execution of brain neurons is attempted. The outputs generated from these have been used in forecasting and trade stabilization. In the research pages, they mentioned seven predictive models in the neural network for more efficient output. Sample. One of its features mentioned is training and referrals[7].

2.3 EXISTING SYSTEM

As many people have invested their time and efforts in this global enterprise to make it closer and more reliable for people to tap resources and make their way of life more sustainable. more sophisticated than before. In recent years, various strategies and plans have been developed and implemented since it was continued and this topic has always been a research point where people come up with ideas to tackle. Intelligence fascinates humanity and having it in the machine and integrating it on it is the foundation of research.

Several people contributed to the same study. All the learning systems of the past were limited and of the simplest nature, where learning a simple algorithm for averaging was not enough, can even be done by the human brain itself. The motto of learning is the main is still limited, the learning model is not effective. Existing models cannot cope with vulnerabilities and discard the rarest information they cannot process, resulting in large data loss creating forecasting problems. Observation is an integral part of resource forecasting and management. If results cannot be observed, time will suffer, making it less responsible in the market[2].

Existing systems cannot monitor these. The existing system in the warehouse forecast seems to be biased because it considers a single point source for the data source. Before data set predictions, a simple data recovery should be created and tested on the training dataset, which is more flexible and resilient in nature. Vision loss is a big problem in the current system because inventory changes on a daily basis and the loss rate can be higher over time. A first case is made for prediction.

2.4 PROPOSING SYSTEM

Stocks are unpredictable and liberal in nature. Following the same is wonderful and reluctant in nature. Looking for predictability and getting closer to it is the best goal for the same outcome. However, exact and exact estimates of the same are possible. There are various constraints that affect stock prices and ratios. These constraints must be taken into account before reaching conclusions and the source of the report.

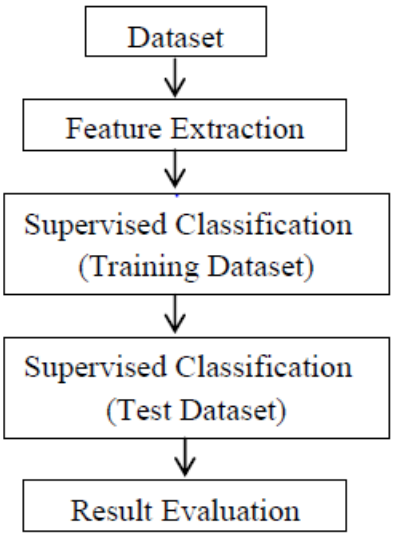

Fig 2.4 : System Flow Diagram

Here, as depicted in the figure above, the proposed system will have an entry from the dataset that will be appropriately extracted and stored below. The classification technique used is monitored and various machine-level algorithmic techniques are performed on it. The training dataset is generated to train the machine and the test cases are derived and deployed to perform visualization and graphing. The results produced are transmitted and displayed graphically[4].

2.5 SOFTWARE DESCRIPTION

2.5.1 JUPYTER NOTEBOOK

Jupiter Notebook aka IPython Notebook is a web-based interactive computing way to get started with Jupiter Notebook documents. The term manual itself is a giant entity to denote integration with different groups of entities. JSON is the same primary form of document to execute after the schema summary and input and output facilities. It is highly integrated with many language sets and has a lot of flexibility with choices.

The extension used for the same is ".ipynb" which runs on this platform. It is an open source software package with interactive communication facilities. It has open standards for the same. It's an open community ideal for budding programmers. Its versatility is phenomenal and beautifully executed, its configuration and integration are the simplest and easiest to maintain so as not to create previous distortions, and its effectiveness is measured through whichever system is selected. These are the best software packages that have been cross-used for product design and development and support extensive support. Not only that, it provides extensibility in the code and their implementation.

Various languages can be changed and projects can be done on the same field. The created notebook files can be shared and stored in various ways for later use. It supports cultured and interactive output sets. Easily switch to graphs, plots, and visualizations of elements. Integrate the same data at its best. Integrate big data and it can handle many parts of the value in the range of approximations. time gives better performance and higher means of computation. Various data jobs such as cleaning, cleaning, transformation modeling and visualization can be performed similarly.

3. REQUIREMENT ANALYSIS

3.1 FUNCTIONAL REQUIREMENTS

Functional requirements relate to the functionality of the software in a technical view. The flow of components and their structural flow is enhanced and described by it. Function statements process classified raw data sets and learn from the same data sets.

Then the data sets are classified into clusters and checked for spuriousness. After cleaning the dataset, the data is cleaned and the machine learns and finds the defined pattern for the same sample, it goes through many different iterations and produces an output.

3.2 NON-FUNCTIONAL REQUIREMENTS

Non-functional requirements deal with external factors of a non-functional nature. It is used for analytical purposes. According to the same judgment operations are carried out to implement it. Stock is actionable and constantly changing, so these extra effects and claims help it get the latest updates and fit all in one go where the techs can do work and correct errors or drafts as necessary.

Non-functional requirements are followed by efficiency and its rate of return. Easy to use code for efficiency and security dashboard deployment and study. System reliability and performance are maintained through its integration and portability.

3.3 HARDWARE REQUIREMENTS

Processor :	Minimum Intel Core i3
RAM :	4GB Recommended
Hard Disk :	5GB Diskspace Recommended

3.4 SOFTWARE REQUIREMENTS

Operating system :	Windows or Linux
IDE :	Jupyter Notebook
Dataset :	".csv" files
Modules :	Pandas, Matplotlib, Keras, sklearn

4. DESIGN

4.1 DESIGN GOALS

In order for the project to go smoothly, we need to plan and design meanings such as system architecture and diagrams as defined below.

4.1.1 DATA COLLECTION

Data collection is one of the important and basic things in our project. The right dataset must be provided to get robust results. Our data mainly consists of previous year or weeks stock prices. We will be taking and analyzing data from Kaggle & GitHub. After that seeing the accuracy we will use the data in our model.

4.1.2 DATA PREPROCESSING

Human can understand any type of data but machine can't our model will also learn from scratch so it's better to make the data more machine readable. Raw data is usually inconsistent or incomplete. Data preprocessing involves checking missing values, splitting the dataset and training the machine etc.

4.1.3 TRAINING MODEL

Similar to feeding somethings, machine/model should also learn by feeding and learning on data. The data set extracted from Kaggle will be used to train the model. The training model uses a raw set of data as the undefined dataset which is collected from the previous fiscal year and from the same dataset a refine view is presented which is seen as the desired output. For the refining of the dataset various algorithms are implemented to show the desired output.

4.2 SYSTEM ARCHITECTURE

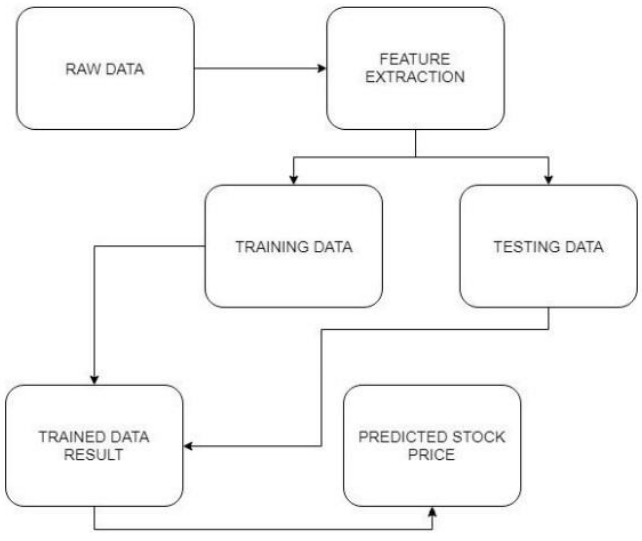

Fig 4.1 : System Architecture

The above figure 4.1 gives the demonstration on the dataset extraction and refining the raw dataset by categorizing into two phases of training and testing data. From the given dataset a well modified categorization is extracted and a graph set is plotted to gain the required output which gives the stock prediction range.

4.3 USE CASE DIAGRAM

A dynamic and behavioral diagram in UML is use case diagram. Use cases are basically set of actions, services which are used by system. To visualize the functionality requirement of the system this, use case diagram are used. The internal and external events or party that may influence the system are also picturized. Use case diagram specify how the system acts on any action without worrying to know about the details how that functionality is achieved.

For this project we have created the below mentioned use case diagram.

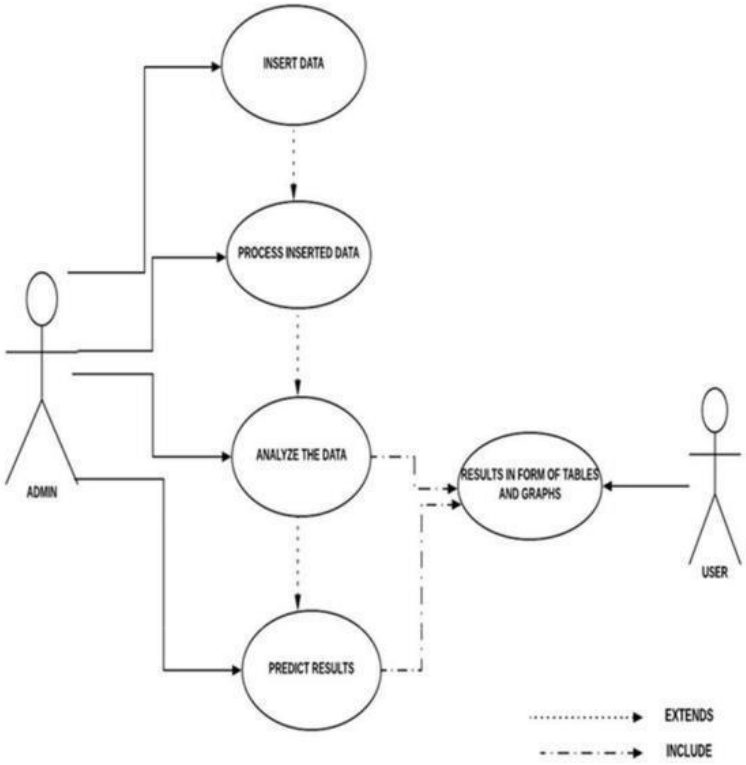

Fig 4.2 : Use Case Diagram for Stock Price Prediction

The above figure 4.2 shows the use-case diagram of the entitled project and its flow. From the diagram it's seen that the user gives the raw dataset as input and with the flow of the input in the system.

The system evaluates and process the dataset train itself with the provided dataset and extract the meaningful dataset to process and refine the cluster data and from the given cluster of the data, the plotting of the data values are shown and with the given range the system plots the data gives a figurative output as prediction and display the same as the refined output in the display screen.

4.4 DATA FLOW DIAGRAM

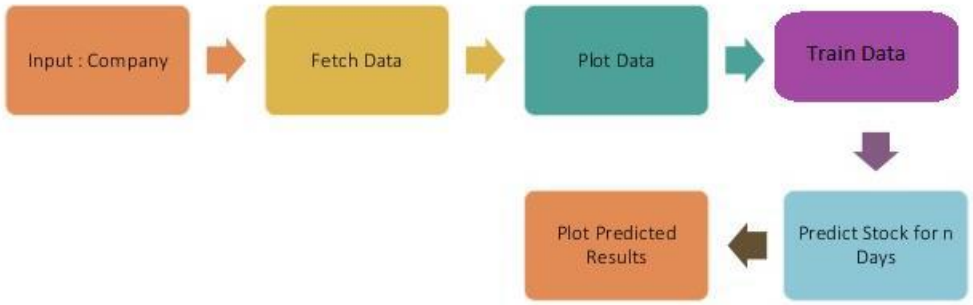

Fig 4.3 : Data Flow Diagram

In the above fig 4.3 This project will be taking a company, fetching the data of the company from the panda's data-reader library then plotting the data, then the program trains the data to predict the stock for certain number of days. In this way data is flowing in our system.

5. IMPLEMENTATION

These are the Machine Learning Algorithms implemented during the building of the project.

5.1 DECISION TREE REGRESSION

Decision Tree is one of the most commonly used, practical approaches for supervised learning. It can be used to solve both Regression and Classification tasks with the latter being put more into practical application.

It is a tree-structured classifier with three types of nodes. The *Root Node* is the initial node which represents the entire sample and may get split further into further nodes. The *Interior Nodes* represent the features of a data set and the branches represent the decision rules. Finally, the *Leaf Nodes* represent the outcome. This algorithm is very useful for solving decision-related problems.

With a particular data point, it is run completely through the entirely tree by answering *True/False* questions till it reaches the leaf node. The final prediction is the average of the value of the dependent variable in that particular leaf node. Through multiple iterations, the Tree is able to predict a proper value for the data point.

5.2 LONG SHORT TERM MEMORY

Sequence prediction problems have been around for a long time. They are considered as one of the hardest problems to solve in the data science industry. These include a wide range of problems; from predicting sales to finding patterns in stock markets' data, from understanding movie plots to recognizing your way of speech, from language translations to predicting your next word on your iPhone's keyboard. With the recent breakthroughs that have been happening in data science, it is found that for almost all of these sequence prediction problems, Long short Term Memory networks, LSTMs have been observed as the most effective solution.

LSTMs have an edge over conventional feed-forward neural networks and RNN in many ways. This is because of their property of selectively remembering patterns for long durations of time. The purpose of this article is to explain LSTM and enable us to use it in real life problems.

LSTMs on the other hand, make small modifications to the information by multiplications and additions. With LSTMs, the information flows through a mechanism known as cell states. This way, LSTMs can selectively remember or forget things. The information at a particular cell state has three different dependencies. Industries use them to move products around for different processes. LSTMs use this mechanism to move information around[3].This project may have some addition, modification or removal of information as it flows through the different layers, just like a product may be moulded, painted or packed while it is on a conveyor belt.

In [7]:
```
#Convert x_train and y_train to numpy arrays, so we can use them for training
x_train, y_train = np.array(x_train), np.array(y_train)
```

In [8]:
```
#Reshape the data into the shape accepted by the LSTM that is 3 dimensional
x_train = np.reshape(x_train, (x_train.shape[0],x_train.shape[1],1))
```

In [9]:
```
#Build the LSTM network model
model = Sequential()  #Building model using keras library
model.add(LSTM(units=50, return_sequences=True,input_shape=(x_train.shape[1],1)))
model.add(LSTM(units=50, return_sequences=False))
model.add(Dense(units=25))
model.add(Dense(units=1))
```

In [10]:
```
#Compile the model
#mean_squared_parameter Computes the mean of squares of errors between labels and predictions
model.compile(optimizer='adam', loss='mean_squared_error')
```

In [11]:
```
#Train the model
model.fit(x_train, y_train, batch_size=15, epochs=5)
```

This is a part of the Project Work code where the LSTM Model is built. The data has to be divided into the training data (80%) and the testing data (20%) first. Then, The LSTM Model is created using the Keras library. Then, the model is compiled to calculate the loss of the data i.e., is calculated in terms of RMSE (Route Mean Square Error). Then the data is fitted to the model and the model is trained. Later, It is used to predict the Stock prices on the Test Data.

6. TESTING

The purpose of testing is to get errors. Testing is that the process of trying to get every conceivable fault or weakness during a work product. It provides how to see the functionality of components, sub-assemblies, assemblies and/or a finished product it's the method of exercising software with the intent of ensuring that the software meets its requirements and user expectations and doesn't fail in an unacceptable manner. There are various sorts of test. Each test type addresses a selected testing requirement. The various types of testing that follows are listed as below.

6.1 UNIT TESTING

Unit testing involves the planning of test cases that validate that the interior program logic is functioning properly, which program inputs produce valid outputs. All decision branches and internal code flow should be validated. it's the testing of individual software units of the appliance.

It is done after the completion of a private unit before integration. this is often a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a selected business process, application, and/or system configuration. Unit tests make sure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

6.2 INTEGRATION TESTING

Integration tests are designed to check integrated software components to work out if they really run together program. Testing is event driven and is more concerned with the essential outcome of screens or fields.

Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the mixture of components is correct and consistent. Integration testing is specifically aimed toward exposing the issues that arise from the mixture of components.

6.3 VALIDATION TESTING

Validation testing is that the process of ensuring if the tested and developed software satisfies the client /user needs. The business requirement logic or scenarios need to be tested intimately. All the critical functionalities of an application must be tested here.

As a tester, it's always important to understand the way to verify the business logic or scenarios that are given to you. One such method that helps intimately evaluation of the functionalities is that the Validation Process.

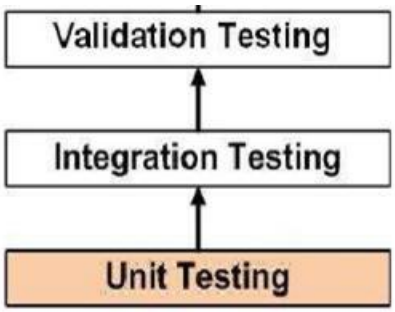

Fig 6.1 : Testing Process

6.4 SYSTEM TESTING

System testing of software or hardware is testing conducted on an entire, integrated system to gauge the system's compliance with its specified requirements. System testing falls within the scope of recorder testing, and intrinsically, should require no knowledge of the inner design of the code or logic.

As a rule, system testing takes, as its input, all of the "integrated" software components that have successfully passed integration testing and also the software itself integrated with any applicable hardware system(s).

System testing may be a more limited sort of testing; it seeks to detect defects both within the "inter-assemblages" and also within the system as an entire.

System testing is performed on the whole system within the context of a Functional Requirement Specification(s) (FRS) and/or a System Requirement Specification (SRS).

System testing tests not only the planning, but also the behavior and even the believed expectations of the customer. it's also intended to check up to and beyond the bounds defined within the software/hardware requirements specification(s).

7. EXPERIMENTAL RESULTS

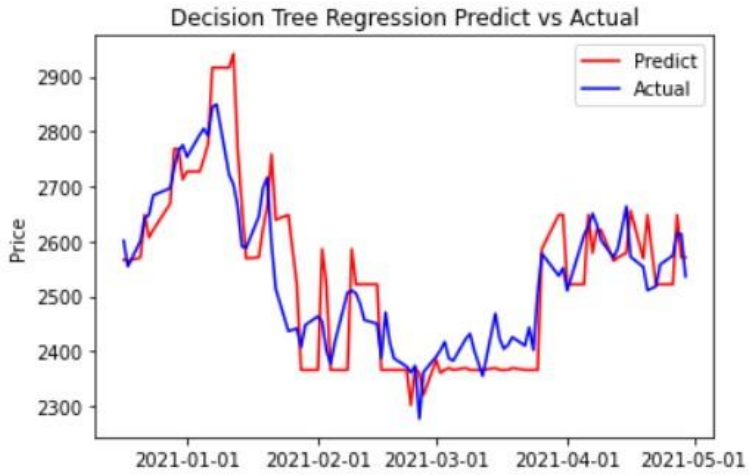

Fig 7.1 : Decision Tree Regressor Model

This is the graph produced by the Decision Tree Model which will be compared with our LSTM Model. By seeing the graph, it is concluded that this Decision Tree Regressor Model is not very accurate in predicting the stock prices of a company. This happens due to moving average problem in the Stocks inconsistent history over time.

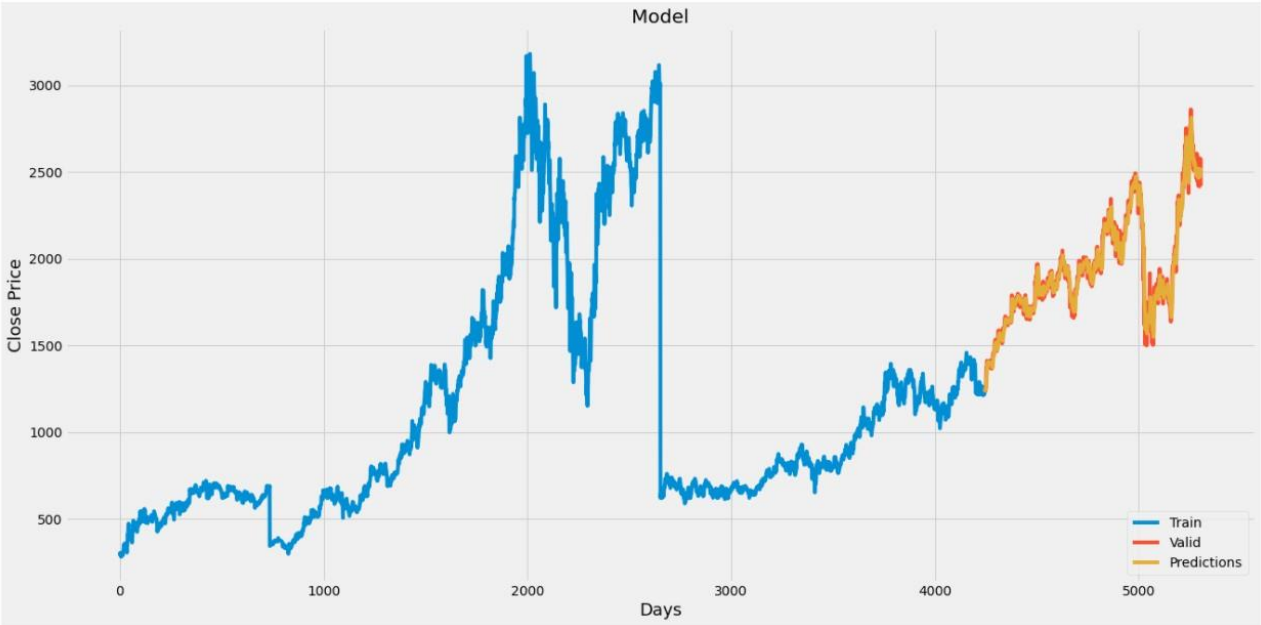

Fig 7.2 : Long Short Term Memory

The above graph depicts the LSTM model of the project. By seeing graph, It is clearly visible that the LSTM model is more accurate and near to the true values of the test data. The LSTM Model achieves a massive 90-95% accuracy with stock previous datasets on the testing data.

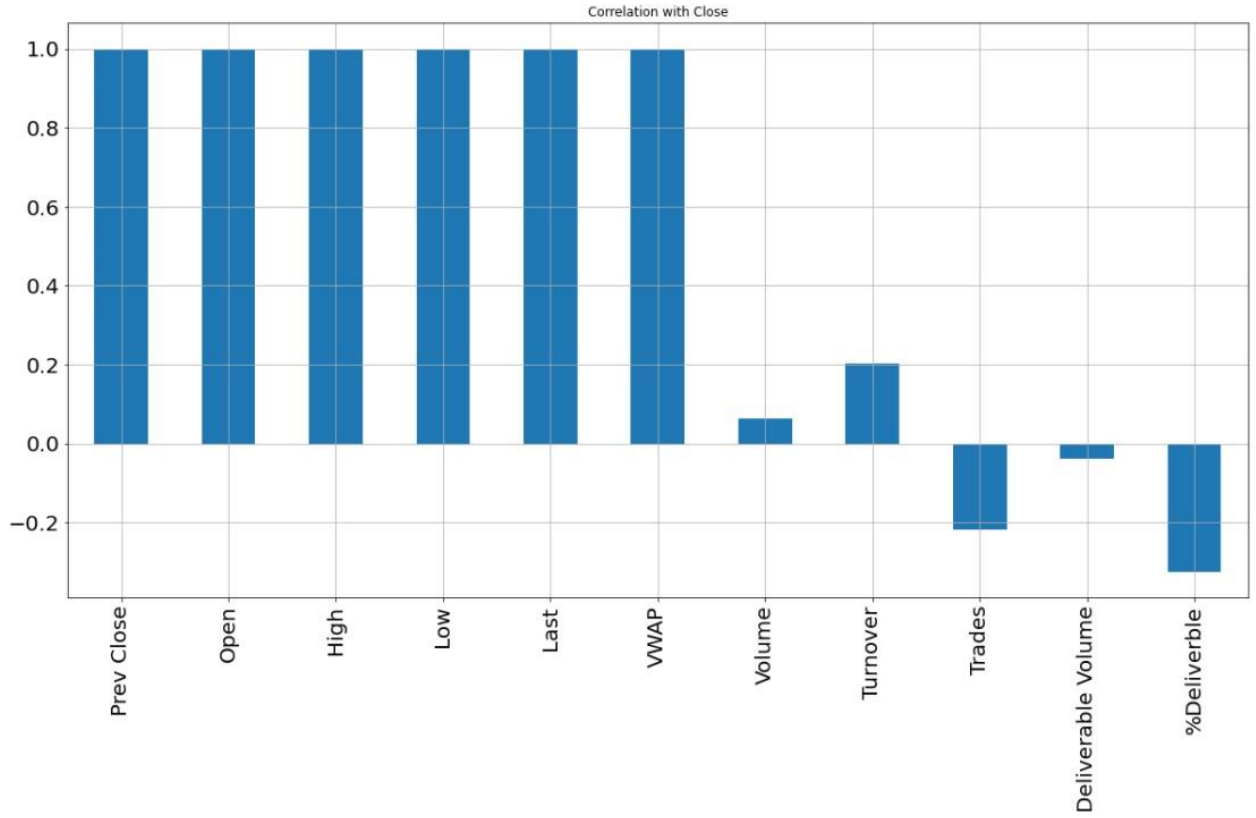

Fig 7.3 : Correlation Analysis of Data

In this Project Work, Correlation Analysis is used to find all the attributes in the dataset which are partially or completely depended on each other. After Correlation Analysis, it is seen that five attributes are depended on each other and rest of the attributes are removed in pre-processing of the dataset.

Table – 7.1: Test Case – 1

7.1 Test Case Number	TC_01
Module Under Test	Data Extraction
Description	When the program is executed, the program tries to read the ".csv" file for using the dataset of the respective stock company given in the code.
Output	If the file path is correct and the file name given in the code is correct, the data is extracted. If the details entered are incorrect, the program will show the error.
Remarks	Test Successful

Input:

```
In [2]: df_final = pd.read_csv("datasets/ASIANPAINT.csv",na_values=['null'],index_col='Date',parse_dates=True,infer_datetime_format=True)

In [3]: df_final.head()
```

Output:

Out[3]:

Date	Symbol	Series	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover	Trades	Deliverable Volume	%Deliverble
2000-01-03	ASIANPAINT	EQ	361.20	370.0	390.0	370.0	385.0	381.65	380.54	3318	1.262617e+11	NaN	NaN	NaN
2000-01-04	ASIANPAINT	EQ	381.65	380.0	392.0	375.0	390.0	385.55	383.50	4818	1.847699e+11	NaN	NaN	NaN
2000-01-05	ASIANPAINT	EQ	385.55	371.5	390.0	371.5	383.0	383.00	379.81	2628	9.981384e+10	NaN	NaN	NaN
2000-01-06	ASIANPAINT	EQ	383.00	384.9	384.9	374.5	375.1	377.50	379.88	3354	1.274114e+11	NaN	NaN	NaN
2000-01-07	ASIANPAINT	EQ	377.50	376.0	390.0	370.0	389.0	385.70	383.38	9589	3.676275e+11	NaN	NaN	NaN

Fig 7.4 : Sample Data

If the details of the dataset file entered are correct, the program should not generate an error, it should execute without an error. If the details entered are wrong, the program will generate an error that “File Not Found Error”. As the details are correct, the code will print the few starting rows as mentioned in the code.

Table – 7.2: Test Case – 2

7.2 Test Case Number	TC_02
Module Under Test	Creating Train and Test Data.
Description	The program will divide the given input into 80% Train data and 20% Test Data.
Input	The required input is given.
Output	Inbuilt data dividers divide the data into training data and test data.
Remarks	Test Successful

Input:

Train test Split using Timeseriessplit

```
In [14]: ts_split= TimeSeriesSplit(n_splits=10)
         for train_index, test_index in ts_split.split(feature_minmax_transform):
                X_train, X_test = feature_minmax_transform[:len(train_index)], feature_minmax_transform[len(train_index): (len(train_inde
                y_train, y_test = target_adj_close[:len(train_index)].values.ravel(), target_adj_close[len(train_index): (len(train_index
```

Output:

```
In [19]: print("The Training data is:\n")
         print(X_train)

The Training data is:

                Open      High       Low    Volume
Date
2000-01-03  0.031929  0.034628  0.033562  0.000285
2000-01-04  0.033925  0.035026  0.034573  0.000415
2000-01-05  0.032228  0.034628  0.033865  0.000225
2000-01-06  0.034903  0.033615  0.034472  0.000288
2000-01-07  0.033126  0.034628  0.033562  0.000828
...              ...       ...       ...       ...
2019-01-11  0.237423  0.236576  0.240273  0.040999
2019-01-14  0.238271  0.237450  0.238867  0.117858
2019-01-15  0.235198  0.238215  0.239504  0.117435
2019-01-16  0.239468  0.237917  0.239322  0.103030
2019-01-17  0.235477  0.235046  0.238534  0.073949

[4742 rows x 4 columns]
```

```
In [20]: print("The Testing data is:\n")
         print(X_test)

The Testing data is:

                Open      High       Low    Volume
Date
2019-01-18  0.235677  0.236288  0.238372  0.094593
2019-01-21  0.236515  0.240272  0.240839  0.217701
2019-01-22  0.242242  0.241713  0.236805  0.474951
2019-01-23  0.243260  0.241196  0.239787  0.234043
2019-01-24  0.237473  0.238027  0.241101  0.135353
...              ...       ...       ...       ...
2020-12-10  0.460168  0.464279  0.464411  0.205517
2020-12-11  0.460178  0.461278  0.463198  0.188086
2020-12-14  0.462972  0.464656  0.468455  0.110889
2020-12-15  0.463970  0.461616  0.464714  0.111144
2020-12-16  0.464968  0.471413  0.471811  0.166366

[474 rows x 4 columns]
```

Fig 7.5 : Train & Test Data

The whole dataset is given as input to the program code. The program will first perform the pre-processing of the data and remove the un-necessary attributes from the datasets. Then, the program uses the minmax scaler to scale all the dataset values between 0 to 1.

Table – 7.3: Test Case – 3

Test Case Number	TC_03
Module Under Test	Plotting of data.
Description	When the data is ready then the program uses the matplotlib module to plot the data into the graph
Input	The input is Data.
Output	If the data is valid, the graph is plotted.
Remarks	Test Successful

Input:

```
In [3]: #Plotting the closing price history graph using matplotlib library
        plt.figure(figsize=(16,8),edgecolor='Black')
        plt.title('Close Price History')
        plt.plot(df['Close'])
        plt.xlabel('Days',fontsize=18)
        plt.ylabel('Close Price',fontsize=18)
        plt.show()
```

Output:

Fig 7.6 : Stocks History Graph

When the dataset is given as the input, if the data in the dataset is valid, then the graph is plotted using the matplotlib library. The dataset read through the pandas module and the graph is plotted using the input code.

8. CONCLUSION & FUTURE ENHANCEMENT

8.1 CONCLUSION

To conclude, the stock is an unpredictable mechanism that follows the segments of the chain, and the chain dependencies are unpredictable. It is defined as a curve that continuously changes and pushes the price up and down and vice versa. Since the integration of the same is higher with other dependencies, leaving a dependency affects the level of accuracy.

In the project, various high level machine learning algorithms are implemented and integrated and the results are generated from it, making it possible for the user to see the output in the form of a graph, allowing him to see and explain more easily what the situation is and they can jointly decide to invest and profit from it.

Recommended software takes raw data set from dataset or .csv file and processes it. Data cleaning and cleaning is performed and then further processed to achieve efficient results. After calculating the average, the results are displayed on the screen as a graph.

This Project Work addressed the Program Outcomes (POs): PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO11, PO12 and Program Specific Outcomes (PSOs): PSO1, PSO2 & PSO3. These Program Outcomes (POs) and Program Specific Outcomes (PSOs) are attained by demonstrating the working model of the project.

8.2 FUTURE ENHANCEMENT

The stock market is the best alternative for business growth and a side income for individuals who are willing to invest and earn money. Stock futures have been around since then and it is going up every day. There are thousands of investors who invest together and earn a lot of money. There are mid-level dealers and stock sellers alike. The cost of stock advice is cumbersome and expensive.

So, when it comes to people they think a lot and invest and have no chance or certainty that the same will produce a profitable outcome. The stock is therefore unpredictable and its uptrend is higher than ever. If the stock market and its predictions can be accurate, it will be to the benefit of both individuals and institutions. The element of risk must be minimized so that the system efficiency is high and everyone can be assured of their investment of time.

The project can be continued to achieve predictive performance with additional implementations of possible content related to the real-time scenario and how the script is run and processed in real-time. Various constraints need to be added and their performance may be changed in the future to achieve efficient results. The expected appearance of the display is a chart where the same appearance and settings can be integrated, and the same pie chart and a custom chart can be implemented.

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