VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama", Belagavi: 590 018

A Mini Project Report

On

"STOCK PRICE PREDICTION"

Submitted in partial fulfillment of the requirement for the award of Degree of Bachelor of Engineering in Computer Science and Engineering

Submitted by

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SVCE BENGALURU

SRI VENKATESHWARA COLLEGE OF ENGINEERING

— Affiliated to VTU, Approved by AICTE, Recognised by UGC u/s 2(f) & 12(B)—

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SRI VENKATESHWARA COLLEGE OF ENGINEERING

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2023– 2024

SRI VENKATESHWARA COLLEGE OF ENGINEERING

Vidyanagar, Bengaluru, Karnataka, India-562157

Department of Computer Science & Engineering

CERTIFICATE

This is to certify that Mini Project entitled **"STOCK PRICE PREDICTION"** is submitted by **ABHISHEK PANDEY[1VE21CS004], ATUL RATHORE[1VE21CS023] and ATUL YADAV[1VE21CS024]** on partial fulfillment of sixth semester, Bachelor of Engineering in Computer Science and Engineering, Visvesvaraya Technological University for the academic year 2023-2024.

.....	.....	.....
Signature of Guide	**Signature of Co-Ordinator**	**Signature of the HOD**

ACKNOWLEDGEMENT

The satisfaction and euphoria that accompany the successful completion of any task would be incomplete without complementing those who made it possible, whose guidance and encouragement made our efforts successful.

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ABSTRACT

This project focuses on the development of a stock price predictor leveraging machine learning techniques. The unpredictability of stock markets poses a significant challenge for investors and traders alike. Traditional methods of analysis often fall short in capturing the complex dynamics of market behavior. In response, machine learning models offer a promising avenue for forecasting stock prices with greater accuracy.

Evaluation of the models is conducted using standard performance metrics such as Mean Absolute Error (MAE), Mean Squared Error (MSE), and Root Mean Squared Error (RMSE). Additionally, back testing techniques are employed to assess the practical viability of the predictor in a real-world trading scenario.

The ultimate objective of this project is to develop a robust and reliable stock price predictor that can assist investors and traders in making informed decisions, thereby mitigating risks and maximizing returns in the dynamic landscape of financial markets.

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INTRODUCTION

The unpredictability of stock markets has long been a challenge for investors and traders seeking to make informed decisions in an environment characterized by volatility and uncertainty. Traditional methods of stock price prediction, often reliant on fundamental and technical analysis, have limitations in capturing the complex dynamics and inherent noise of financial markets. In response to these challenges, the application of machine learning techniques has emerged as a promising approach to enhance predictive accuracy and capture subtle patterns in market behavior. The aim of this project is to develop a stock price predictor that leverages machine learning algorithms to forecast future price movements. By harnessing the power of historical stock data, technical indicators, and sentiment analysis of news articles, the project seeks to build models capable of making accurate predictions in dynamic market conditions. The integration of advanced machine learning algorithms, coupled with feature engineering techniques, aims to extract meaningful insights from the data and improve forecasting performance. By developing a robust and reliable stock price predictor, this project aims to empower investors and traders with valuable insights, enabling them to make informed decisions and navigate the complexities of financial markets more effectively.

KEY STEPS IN DATA PREPARATION AND INITIAL ANALYSIS:

Importing libraries is the initial step in any data analysis or modeling endeavor, laying the foundation for subsequent tasks. This phase involves incorporating essential tools for data manipulation, visualization, and machine learning algorithms, such as pandas, seaborn, matplotlib, and scikit-learn. By importing these libraries, analysts and researchers equip themselves with the necessary resources to effectively handle, explore, and analyze data, facilitating informed decision-making and model development. Data preparation is a critical step in building a stock price predictor. Here are the key steps involved in data preparation: Data Collection: Gather historical stock price data for the target securities from reliable sources such as financial data providers or APIs. Additionally, collect relevant data such as trading volume, market indices, and economic indicators that may impact stock prices. Data Cleaning: This step involves identifying and handling missing values, outliers, and inconsistencies in the dataset. Impute missing values using techniques like interpolation or forward/backward filling. Remove outliers that could skew the analysis or introduce bias into the model. Feature Selection: Selecting the most relevant features is crucial for model performance and computational efficiency. Conduct exploratory data analysis (EDA) to identify potential predictors and remove redundant or irrelevant features. Consider incorporating technical indicators (e.g., moving averages, Relative Strength Index) and sentiment analysis of news articles to enrich the dataset. Splitting the Data: Divide the dataset into training, validation, and test sets. The training set is used to train the model, the validation set is used to tune hyperparameters and evaluate model performance during training, and the test set is used for final evaluation to assess the model's generalization ability. By following these key steps in data preparation, you can ensure that your dataset is clean, informative, and well-prepared for training robust and accurate stock price prediction models.

MODEL BUILDING:

Various machine learning algorithms are essential for building predictive models in stock price prediction, offering distinct strengths and applications. LSTM Bidirectional, LSTM 2- Path, GRU, GRU Bidirectional, GRU 2-Path, Vanilla, Vanilla Bidirectional and Vanilla 2 represent a diverse set of approaches used in this field. Each algorithm addresses specific data types and problem scenarios, enriching the predictive modeling landscape for stock price prediction assessment. The main building model in stock price prediction is Deep-learning model. Deep learning models, particularly recurrent neural networks (RNNs) and their variants like Long Short-Term Memory (LSTM) networks, have shown promising results in stock price prediction tasks due to their ability to capture temporal dependencies and nonlinear patterns in time series data. Here's how we can incorporate deep learning models into your stock price predictor project: Data Preprocessing: Prepare the historical stock price data in a suitable format for training deep learning models. Ensure that the data is properly normalized to stabilize training and prevent vanishing/exploding gradients. LSTM Network: LSTM networks are well-suited for modeling sequential data with long-term dependencies. Construct an LSTM architecture with multiple layers to capture complex temporal patterns in the stock price data. Experiment with different architectures, such as varying the number of LSTM layers, hidden units, dropout rates, and learning rates, to find the optimal configuration for your model. Utilize techniques like grid search or random search to efficiently search the hyperparameter space and identify the best-performing model. Model Evaluation: Evaluate the trained deep learning model on the validation and test sets using appropriate evaluation metrics such as Mean Absolute Error (MAE), Mean Squared Error (MSE), and Root Mean Squared Error (RMSE). Validate the predictive performance of the deep learning model using backtesting techniques on historical data. Once satisfied with the model's performance, deploy it into production, and continuously monitor its predictions in real-world trading scenarios. By incorporating deep learning models into the stock price predictor project, we can leverage their ability to capture complex patterns in time series data and potentially improve prediction accuracy compared to traditional machine learning approaches

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 }
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 Settings
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 <th>Investment</th>
 <th>Balance</th>
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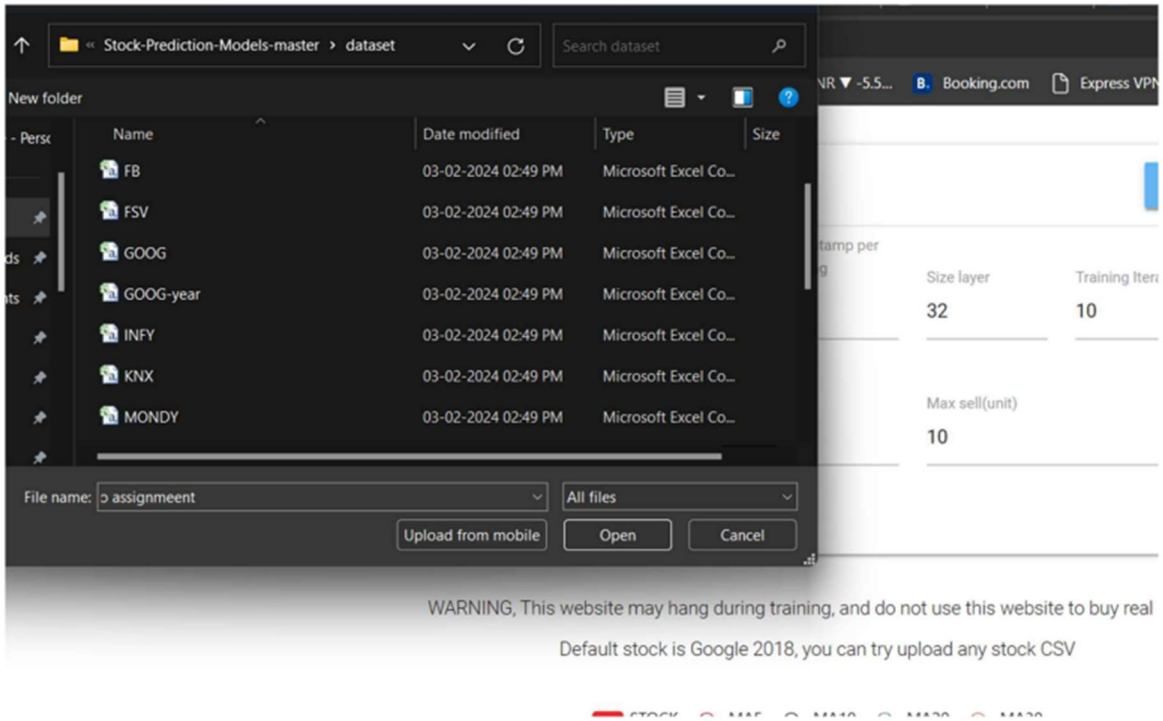
SCREENSHOTS:

LODING DATASETS:

	A	B	C	D	E	F	G
	Date	Open	High	Low	Close	Adj Close	Volume
	########	17721.75	17870.3	17584.2	17854.05	4.24E+08	34503.67
	########	17818.55	17823.7	17698.35	17764.6	2.83E+08	21864.88
	########	17790.1	17811.15	17652.55	17721.5	3.54E+08	23611.08
	########	17750.3	17898.7	17744.15	17871.7	2.91E+08	23733.4
	########	17885.5	17916.9	17779.8	17893.45	2.61E+08	21529.97
	########	17847.55	17876.95	17801	17856.5	2.32E+08	17063.99
	########	17859.1	17880.7	17719.75	17770.9	2.31E+08	17406.31
	########	17840.35	17954.55	17800.05	17929.85	2.45E+08	20579.8
0	########	17896.6	18034.1	17853.8	18015.85	2.29E+08	21457.34
1	########	18094.75	18134.75	18000.65	18035.85	2.3E+08	18891.55
2	########	17974.85	18034.25	17884.6	17944.2	2.08E+08	16998.33
3	########	17965.55	18004.35	17818.4	17844.6	1.75E+08	14729.07
4	########	17905.8	17924.9	17800.3	17826.7	1.98E+08	15593.09
5	########	17755.35	17772.5	17529.45	17554.3	2.04E+08	17162.09
6	########	17574.65	17620.05	17455.4	17511.25	2.41E+08	19313.68
7	########	17591.35	17599.75	17421.8	17465.8	2.09E+08	16100.18
8	########	17428.6	17451.6	17299	17392.7	2.46E+08	16638.41
9	########	17383.25	17440.45	17255.2	17303.95	4.21E+08	32959.77
0	########	17360.1	17467.75	17345.25	17450.9	2.73E+08	19784.53
1	########	17421.5	17445.8	17306	17321.9	3.11E+08	22068.68
2	########	17451.25	17644.75	17427.7	17594.35	3.56E+08	24143.96
3	########	17680.35	17799.95	17671.95	17711.45	3.63E+08	26959.41
4	########	17665.75	17766.5	17602.25	17754.4	2.67E+08	23155.56

PICK FILE FROM MODELLING:



TRAIN THE MODEL:

PREDICTION:


WARNING, This website may hang during training, and do not use this website to buy real stock!
Default stock is Google 2018, you can try upload any stock CSV
STOCK
MA5
MA10
MA20
MA30
predicted close
real histogram
predict histogram
loss graph


STOCK
MA5
MA10
MA20
MA30
predicted close
2018-04-20
Volume: 1,889,700
2018-04-20
STOCK:
open: 1,082
close: 1,072.959961
lowest: 1,069.569946
highest: 1,092.349976
MA5: 1,068.98
MA10: 1,047.37
MA20: 1,033.49
MA30: 1,063.49
predicted close: 1,103.556661094000

GRAPHS:

SIMILATION LOG:

Simulation log

Date	Action	Price	Investment	Balance
2017-07-10	buy 5 units	4643.999940000001	NULL	5356.000059999999
2017-07-17	sell 5 units	4767.099915	2.6507316233944547%	10123.099975
2017-07-28	buy 5 units	4707.650145	NULL	5415.44983
2017-08-17	sell 5 units	4554.8999	-3.2447238068919666%	9970.34973
2017-08-28	buy 5 units	4569.04999	NULL	5401.2997399999995
2017-09-08	sell 5 units	4632.5	1.3886915253470378%	10033.799739999999
2017-09-26	buy 5 units	4624.299924999999	NULL	5409.499814999999
2017-10-06	sell 5 units	4894.450075000001	5.841968608902474%	10303.94989
2017-10-24	buy 5 units	4852.69989	NULL	5451.25
2017-11-02	sell 5 units	5127.89978	5.671067575538876%	10579.14978
2017-11-16	buy 5 units	5162.5	NULL	5416.64978

CONCLUSION

In conclusion, the development of a stock price predictor leveraging machine learning and deep learning techniques represents a significant step forward in empowering investors and traders with valuable insights for navigating the dynamic landscape of financial markets. Throughout this project, we have explored various methodologies and approaches to build a robust and accurate predictor capable of forecasting future stock prices. We began by collecting and preprocessing historical stock price data, incorporating relevant features such as technical indicators and sentiment analysis of news articles. Through meticulous data preparation, we ensured that our dataset was clean, informative, and wellsuited for training predictive models. Next, we delved into model building, experimenting with a diverse range of machine learning algorithms, including linear regression, support vector machines, random forests, and deep learning architectures such as LSTM networks. By evaluating and comparing the performance of these models using appropriate metrics, we identified the most effective approaches for stock price prediction. In deploying the stock price predictor into production, we recognize the importance of continuous monitoring and refinement to adapt to changing market conditions and maintain predictive accuracy over time. In essence, this project underscores the transformative potential of machine learning and deep learning technologies in enhancing decision-making processes in financial markets. By developing a reliable stock price predictor, we aim to equip investors and traders with valuable tools for making informed decisions, managing risks, and maximizing returns in an ever-evolving investment landscape

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