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School of Computing Sciences

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Project Title:

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CHAPTER 1

PROJECT DESCRIPTION

This project focuses on a web application that will be able to provide vital information on the stock of a company listed on the market, such as Open, Close, Volume, etc. Our app also provides details on the company's financial and technical details, such as VWAP, MA, etc. In addition to these features, the app provides a stock price forecast for limited stocks listed in the NIFTY 50 index where the closing price of the stock is forecast and shown for the next 3 days so that an investor willing to invest in the company can know when to start investing or selling his holdings. To support this price forecast, an additional feature based on algorithmic trading that provides the buying and selling signals for all the shares listed in the exchange that will help new investors and traders to have an idea of when to enter into a new position or exit their open positions. This can help new investors and traders to make better trading decisions.

CHAPTER 2

LITERATURE SURVEY

Title of the paper	Authors	Name of the Conference/ Journal and year of publication	Methodology	Issues / Limitations
Explainable Deep Convolutional Candlestick Learner	Jun-Hao Chen, Samuel Yen-Chi Chen, Yun-Cheng Tsai, Chih-Shiang Shu	arXiv: 2001.02767v4, Cornell University, May 2020	Gramian Angular Summation Field (GASF), Convolutional Neural Networks (CNN)	Confirmation of the model's working using analytical method is yet to be conducted.
Pattern recognition in trading behaviors before stock	Ao Kong, Robert Azencott, Hongliang Zhu	arXiv: 2011.04939v1, Cornell University, November 2020	Time Series Analysis	Jump Prediction of common and idiosyncratic micro-

price jumps: new method based on multivariate time series classification				trading patterns of individual stocks are not discussed.
The Application of Stock Index Price Prediction with Neural Network	Penglei Gao ,Rui Zhang and Xi Yang	MDPI or Multidisciplinary Digital Publishing Institute Published: 18 August 2020	Multilayer Perceptron (MLP), Long Short Term Memory (LSTM) and Convolutional Neural Network (CNN)	Uses time step 20, which will take a long time if it is to be predicted for a longer interval.
Stock Price Prediction Using Artificial Neural Networks	Padmaja Dhenuvakonda, R. Anandan, N. Kumar	Journal of Critical Reviews Accepted: 10.06.2020	LSTM	Predicts the INTRA day stock price and not for cumulative days.
Stock Price Prediction Using Long	Raghav Nandakumar, Uttamraj K R,	International Research Journal of Engineering and Technology	Recurrent Neural Network (RNN) called	Predicts the end of the day stock price and not

Short Term Memory	Vishal R, Y V Lokeswari	(IRJET), Volume: 05 Issue: 03 | Mar-2018	Long Short Term Memory (LSTM),	for cumulative days.
Fundamental Analysis in China: An Empirical Study of the Relationship between Financial Ratios and Stock Prices	Lijuan Ma, Marcel Ausloos, Christophe Schinckus, H. L. Felicia Chong	School of Business, University of Leicester, Leicester, UK. 2018	SVM Regression	A very basic prediction algorithm. Not effectively being used.
NSE Stock Market Prediction Using Deep-Learning Models	Hiransha M, Gopalakrishnan E.A, Vijay Krishna Menon, Soman K.P	International Conference on Computational Intelligence and Data Science (ICCIDS 2018)	ANN	Only prediction using one dataset. Raises to difficulty for many companies

CHAPTER 3

SOFTWARE REQUIREMENTS

3.1 Python

Python is one of those rare languages which can claim to be both simple and powerful. You will be pleasantly surprised to see how easy it is to concentrate on the solution to the problem rather than on the syntax (i.e. the structure of the program that you are writing) of the language. Python is an easy to learn, powerful programming language. It has efficient high-level data structures and a simple but effective approach to object-oriented programming.

3.2 Python Libraries

The Python Standard Library is huge indeed. The proposed system uses Sklearn, Pandas, Numpy, Tensorflow, Keras, and many more libraries for the prediction.

3.3 Tensorflow

TensorFlow is an end-to-end open source platform for machine learning. It has a comprehensive, flexible ecosystem of tools, libraries and community resources that lets researchers push the state-of- the-art in ML and developers easily build and deploy ML powered applications.

3.4 LSTM – Long Short Term Memory

Long-Short-Term Memory Recurrent Neural Network belongs to the family of deep learning algorithms. It is a recurrent network because of the feedback connections in its architecture. It has an advantage over traditional neural networks due to its capability to process the entire sequence of data. Its architecture comprises the cell, input gate, output gate and forget gate.

3.5 Flask

Flask (source code) is a Python web framework built with a small core and easy-to-extend philosophy.

3.6 HTML

HTML is the standard mark-up language for Web pages.

CHAPTER 4

HARDWARE REQUIREMENTS

4.1 GPU

The following GPU-enabled devices are supported:

NVIDIA® GPU card with CUDA® architectures 3.5, 3.7, 5.2, 6.0, 6.1, 7.0 and higher than 7.0. See the list of CUDA®-enabled GPU cards.

On systems with NVIDIA® Ampere GPUs (CUDA architecture 8.0) or newer, kernels are JIT-compiled from PTX and TensorFlow can take over 30 minutes to start up. This overhead can be limited to the first start up by increasing the default JIT cache size with: 'export CUDA_CACHE_MAXSIZE=2147483648'

For GPUs with unsupported CUDA® architectures, or to avoid JIT compilation from PTX, or to use different versions of the NVIDIA® libraries, see the Linux build from source guide.

CHAPTER 5

PROJECT PLAN AND INDIVIDUAL ROLES

5.1 Project Plan

Our goal is to publish the paper for our project and to make it available as a website so that people can use it to buy and sell stocks and make a profit. We use the micro-service architecture to host the features of our platform, such as predicting, buying and selling signals in the cloud. This provides code independence as each feature is deployed as an API. In the near future, if you need to change the backend codebase or move to another cloud platform, it can be done easily because of the microservice architecture. We also provide a stock screener based on candlestick charts so that traders can search for specific patterns from a wide range of stocks. Important financial details for the company are also displayed so that user can perform fundamental analysis.

5.2 Individual Roles

User experience has a vital role to play in every product. Our UI/UX web application is carefully designed by **Sidharth R. V.** who aims to provide the best possible UX for our users in our web application. But user experience on its own doesn't make a product stand out, it's also the functionality that matters. The main backend services, cloud services, and integration of all the core features of our application are handled by **Sarvesh S.** To provide users with a seamless experience. Finally, the core of our web application, stock price forecast, and algorithmic trading is done by **V. Vaishnav**, which makes our app complete.