BITCOIN ANALYSIS AND PREDICTION

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Abstract - Following the recent boom and bust of cryptocurrency prices, Bitcoin is increasingly regarded as an investment asset. Because of its extreme volatility, there is a need for accurate forecasts on which to make investment decisions. Although previous research has used machine learning to predict Bitcoin prices more accurately, few studies have focused on the feasibility of applying different modelling techniques to samples with different data structures and dimensional features. To anticipate Bitcoin price at various frequencies using machine learning techniques, we first divide Bitcoin price into two categories: daily price and high-frequency pricing. For Bitcoin daily price prediction, a collection of high-dimension features such as property and network, trade and market, attention, and gold spot price are employed, whereas basic trading features obtained from a cryptocurrency exchange are used for 5-minute interval price prediction. Deep learning models lstm and bi-directional lstm are used.

Because bitcoin has grown dramatically in recent years, it is critical to forecast its price more accurately because it will be a future investment trend. People will be able to invest more effectively if prices are forecasted more accurately.

*Key Words***:** cryptocurrency, Bitcoin, machine learning, lstm, bi-directional lstm, more accurately

1.   INTRODUCTION

Bitcoin is a cryptocurrency, which is a type of electronic cash. It is a decentralised digital money that can be sent from user to user on the peer-to-peer Bitcoin network without the involvement of intermediaries. As a result, there is a high level of volatility in the market [1], which presents an opportunity for forecasting. Bitcoin [2] is the most valuable cryptocurrency in the world, and it is traded on over 40 exchanges across the world, accepting over 30 different currencies. Bitcoin is affected by a variety of factors. As a result, it is vital to forecast Bitcoin's value in order to make sound investing decisions. Unlike the stock market, the price of Bitcoin is not affected by business events or interfering governments. As a result, we believe that leveraging machine learning technology to anticipate the price of Bitcoin is vital.

2.   Problem Statement, Objectives and Scope

Problem Statement - The proposed project intends to create a novel way for predicting crypto currency (Bitcoin) prices by analysing accessible datasets and applying machine learning/deep learning algorithms.

Objectives –
1. As described in find the ideal subset of input attributes that leads to the greatest Bitcoin price forecast accuracy with no irrelevant values.
2. Concentrate on incorporating various machine learning and deep learning models.
3. Sliding window validation is a method that has been implemented and may be developed in the future.

Scope - Bitcoin is a type of cryptocurrency that has grown in popularity as a stock market investment. The stock market is influenced by a variety of things. And bitcoin is a type of cryptocurrency that has steadily risen in recent years, with occasional sharp drops that have had no visible impact on the stock market. Because of the volatility, a bitcoin stock market prediction tool is

essential. Deep learning algorithms will be used by the project to produce accurate predictions about whether the price of Bitcoin will rise or fall. Deep learning has been shown to make accurate predictions in a variety of disciplines, including finance, and to outperform more standard statistical methods.

Proposed system / Algorithm

Proposed system - Bitcoin is a type of cryptocurrency that has grown in popularity as a stock market investment. The stock market is influenced by a variety of things. And bitcoin is a type of cryptocurrency that has steadily risen in recent years, with occasional sharp drops that have had no visible impact on the stock market. Because of the volatility, a bitcoin stock market prediction tool is essential. BILSTM (Bidirectional Long Short-Term Memory) & LSTM (Long Short-Term Memory) is a sort of RNN module that was later converted and used by many academics, and it, like RNN, consists of recurrently consistent modules. The approach and tools we used to forecast Bitcoin on the stock market yahoo finance can also be used to forecast cryptocurrency prices.

Deep learning algorithms will be used by the project to produce accurate predictions about whether the price of Bitcoin will rise or fall. Deep learning has been shown to make accurate predictions in a variety of disciplines, including finance, and to outperform more standard statistical methods. Unlike traditional statistical methods, which impose structures on models, such as a factor model using a linear regression method, deep learning methods allow models to learn the specific data structure without impositions.

ALGORITHM -

LSTM (LONG SHORT TERM MEMORY):- A recurrent neural network is Long Short Term Memory. The output of the previous step is fed into the current step in RNN. Hochreiter and Schmidhuber created LSTM. It addressed the issue of RNN long-term dependency, in which the RNN cannot predict words stored in long-term memory but can make more accurate predictions based on current input. RNN does not provide efficient performance as the gap length rises. By default, LSTM can save the information for a long time. It is used for time-series data processing, prediction, and classification.

BILSTM (BIDIRECTIONAL LONG SHORT TERM MEMORY):- Bidirectional long-short term memory (bi-lstm) refers to the technique of allowing any neural network to store sequence information in both ways, backwards (future to past) and forwards (past to future).

Our input runs in two directions in bidirectional, distinguishing a bi-lstm from a conventional LSTM. We can make input flow in only one direction using a conventional LSTM, either backwards or forwards. However, with bi-directional, we can

make the input flow in both directions, preserving both the future and the past.

Table -1: Database

| Date	Open	High	Low	Close	Adj Close	Volume
2018-01-18	11198.79981	12107.29981	10942.5	11474.90039	11474.90039	1502039961
2018-01-19	11429.79981	11992.79981	11172.09961	11607.40039	11607.40039	1074040012
2018-01-20	11656.2002	13103	11656.2002	12899.2002	12899.2002	1180170035
2018-01-21	12889.2002	12895.90039	11288.2002	11600.09961	11600.09961	993517977
2018-01-22	11633.09961	11966.40039	10240.2002	10931.40039	10931.40039	1053740032
2018-01-23	10944.5	11377.59961	10129.7002	10868.40039	10868.40039	966060953
2018-01-24	10903.40039	11501.40039	10639.79981	11359.40039	11359.40039	994098995
2018-01-25	11421.7002	11785.7002	11057.40039	11259.40039	11259.40039	887316992
2018-01-26	11256	11656.7002	10470.29981	11171.40039	11171.40039	974619955
2018-01-27	11174.90039	11614.90039	10989.2002	11440.7002	11440.7002	758326988
2018-01-28	11475.29981	12040.29981	11475.29981	11786.29981	11786.29981	835036006
2018-01-29	11755.5	11875.59961	11179.2002	11296.40039	11296.40039	710735974
2018-01-30	11306.79981	11307.2002	10036.2002	10106.29981	10106.29981	863785984
2018-01-31	10108.2002	10381.59961	9777.419922	10221.09961	10221.09961	804116019
2018-02-01	10237.29981	10288.79981	8812.280273	9170.540039	9170.540039	995940044

Results
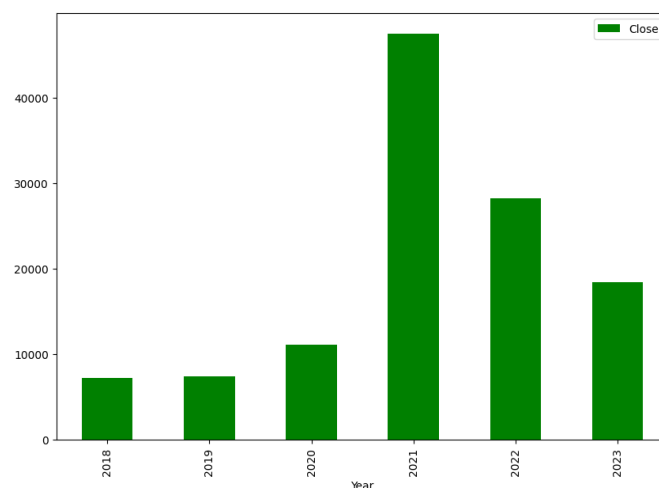
Fig -1: **Yearly average Price of Bitcoin**
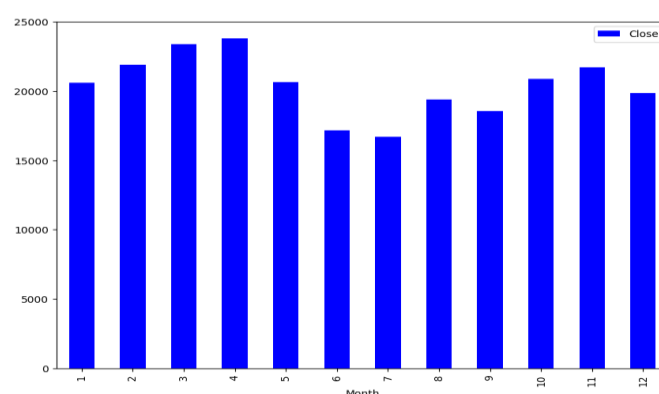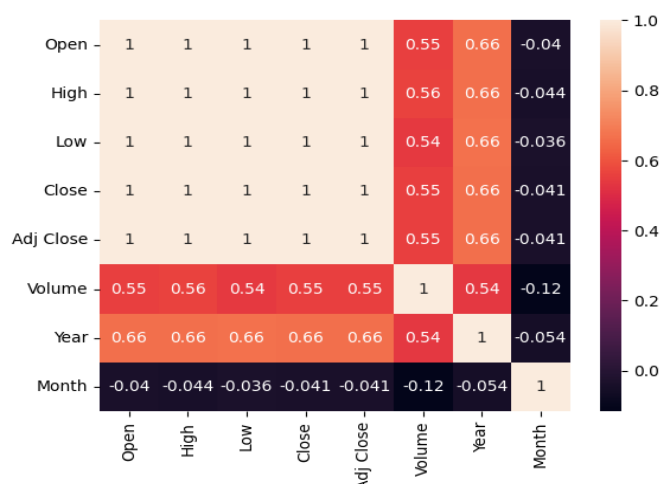

Fig. 2   Monthly average Price of Bitcoin
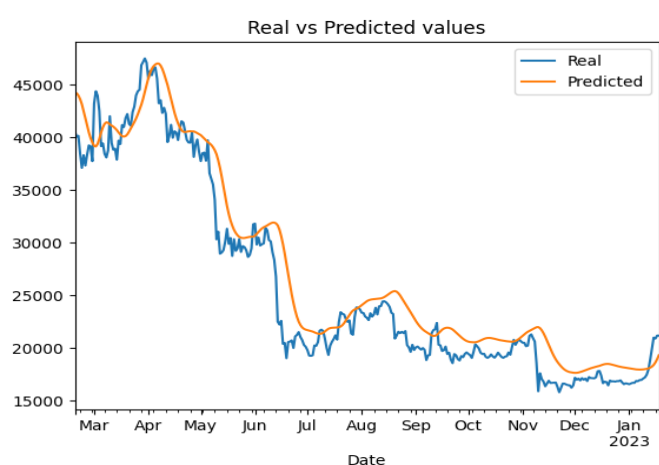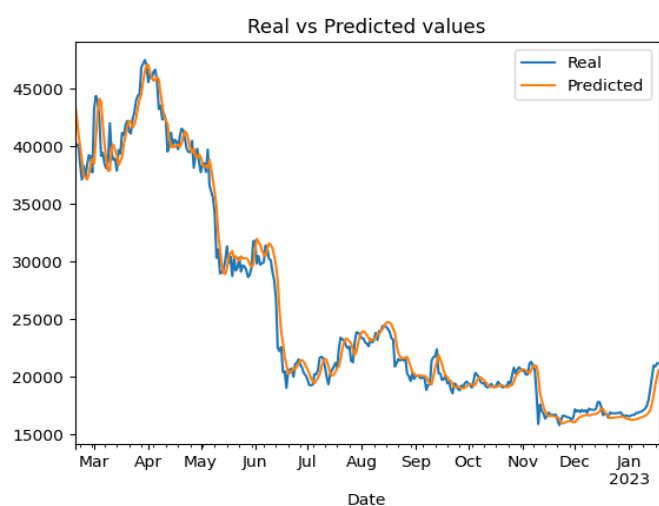
Fig. 3   Heatmap

Fig. 4   LSTM

Fig. 5   BILSTM

Fig. 6   Predicted Price of Bitcoin at 2025-04-10

3. CONCLUSIONS

Deep learning algorithms will always be used to make predictions about the future. In this experiment, we sought to anticipate Bitcoin prices using two deep learning approaches. The study's findings, as described in this thesis, have several important consequences. For starters, complicated models for forecasting the future prices of cryptocurrencies, and to a lesser extent any financial asset, are not always superior to simple persistence models. When it comes to predicting the direction of price movement, neural network-based models like BILSTM perform better.

REFERENCES

[1] M. Briaˆere, K. Oosterlinck, and A. Szafarz, aˆVirtual currency, tangi- ble return: Port- folio diversification with bitcoins,aˆ Tangible Return: Portfolio Diversification with Bitcoins , Available at:

https://dipot.ulb.ac.be/dspace/bitstream/2013/149159/10/wp13031.pdf, 2013.

[2] S. Nakamoto, aˆBitcoin: A Peer-to-Peer Electronic Cash Systemaˆ, Available at: https://bitcoin.org/bitcoi Accessed on 2008.

[3] Sean McNally;Jason Roche;Simon Caton,aˆSean McNally Predicting the price of Bitcoin using Machine Learningaˆ, 26th Euromicro International Conference on Parallel, Distributed and Network-based Processing(PDP) on, 2018

[4] Huisu Jang ; Jaewook Lee;aˆ An Empirical Study on Modeling and Prediction of Bitcoin Prices with Bayesian Neural Networks Based on Blockchain Informationaˆ,Access IEEE,vol.6,pp. 5427-5437, 2017.

[5] H.S. Hota1 ; Richa Handa2 ; A.K. Shrivas3 ,aˆTime Series Data Prediction Using Sliding Window Based RBF Neural Networkaˆ,Procedings of the IEEE 15th International Reuse and Inter- national Conferece on Information Reuse and Integration, IEEE IRI 2014 .

[6] Siddhi Velankar; Sakshi Valecha; Shreya Maji;aˆ Bitcoin Price Prediction using Machine Learningaˆ,20th International Conference on Advanced Communication Technology(ICACT)on, 2018

[7] Jang Huisu; Jaewook Lee ;Hyungjin Ko; Woojin Lee,aˆ Predicting Bitcoin Prices by Using Rolling Window LSTM modelaˆ , DSF, ACM ISBN 123-4567-24-567/08/06. July 2018.

[8] Edwin Sin ;Lipo Wang;aˆ Bitcoin Price Prediction Using Ensembles of neural Networksaˆ, 13th international Conference on Natural Computation, 12 Fuzzy Systems and Knowledge Discovery(ICNC- FSKD),2017

[9] Ruchi Mittal;Shefali Arora;M.P.S Bhatia; aˆAutomated cryptocurrencies price prediction using machine learning aˆ,ICTACT JOURNAL ON SOFTCOMPUTING, VOLUME: 08, ISSUE: 04 JULY, 2018

[10] John Mern1 ; Spenser Anderson1 ; John Poothokaran1 ,aˆUsing Bitcoin Ledger Network Data to Predict the Price of Bitcoinaˆ Stanford University Department of Aeronautics and Astronautics

[11] Yecheng Yao1 , Jungho Yi2 , Shengjun Zhai3 , Yuwen Lin4 , Taekseung Kim5 Guihongx- uan Zhang6 ; Leonard Yoonjae Lee7, aˆPredictive Analysis of Cryptocurrency Price Using Deep Learning aˆ,International Journal of Engineering Technology, 7 (3.27) 258-264 (2018)

[12] Amin Azari,aˆ Bitcoin Price Prediction: An ARIMA Approach aˆ,Available at:https://www.researchg 2018

[13] Isaac Madan, Shaurya Saluja, Aojia Zhao aˆAutomated Bitcoin Trading via Machine Learning Algorithmsaˆ, Department of Computer Science Stanford