

Research on Prediction of Dogecoin Cryptocurrency Price – Milestone 2

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Business Problem: Over the past couple of years, Dogecoin has set the trend for investors to place their trust and money in cryptocurrencies, and there is no doubt that this trend is here to stay. So, wouldn't it be fantastic if we could forecast the price of Dogecoin for tomorrow?

Background/History

The first cryptocurrency, Bitcoin, was an astounding technical advancement that allowed anyone to exchange digital cash for negligible fees and without having to seek anyone's permission. But because Bitcoin was open source, anyone could replicate it, and at one point, everyone did, leading to the emergence of clones like Litecoin and Peercoin everywhere.

The humorous response to this tendency is Dogecoin. In the year 2013, software developers Billy Markus and Jackson Palmer came up with the idea for Dogecoin as a "joke," mocking the irrational speculation that was going on in the cryptocurrency market at the time. In particular, it is regarded as the first "dog coin" and the first "meme coin." Some people view it as a viable investment opportunity even though it is satirical.

Data Explanation (Data Prep/Data Dictionary/etc)

Firstly, I visualized the data and removed the null values from the dataset. Next, to build a Time Series - LSTM model, we need to separate our dataset into a training set and a test set. We need to normalize our data so that all the values are ranged from 0 to 1.

Finally, I worked on the preparation of the training set and test set.

Methods

After the Data preparation, I built the LSTM Network Architecture and applied the model to the dataset. Our next task is to evaluate our trained LSTM model with the test set and then apply the root mean square error (RMSE) metric to examine the performance of the model.

Analysis

When we look at the dataset and our objective of the prediction, the only column we must work on is the close price of the currency. I plotted the cryptocurrency price history and analyzed the price moment. I had to work on how to prepare the data for training and testing dataset.

I used the Scikit-Learn MinMaxScaler to normalize the data ranging from 0 to 1 and reshaped the normalized data into a two-dimensional array.

Later, I defined a sequential model and added LSTM layers, and applied it to the training data.

Finally, to examine the performance of the model, I applied the root mean square error (RMSE) metric to evaluate the trained LSTM model with the test set.

Conclusion

Our findings show that the RMSE is only about 0.00873. The model appears to be working fine. We found that LSTM is a useful tool for predicting cryptocurrency prices. It is important to note, however, that forecasted cryptocurrency prices should not be used as a sole guide to make an investment decision without further analysis. This is because the prediction is based on past price movement, which is not always the only factor influencing future price movement.

Assumptions

I assumed the machine learning algorithm or LSTM model is a great way to predict currency price. But when it comes to the investment decision, there are clearly more factors that needs to be considered.

Limitations

The fundamental drawback of utilizing any machine learning system to forecast cryptocurrency prices is that we can only run a backtest on previous data, and under various unpredictable circumstances, price movement may not necessarily follow the historical trend.

Challenges

To setup the tensorflow environment on my computer was a bit challenging. There were multiple versions of tensorflow and I constantly faced the dead kernel issue in the Jupyter notebook. I had to figure out the working tensorflow version for this model.

Future Uses/Additional Applications

This model could work for various stocks and cryptocurrencies to predict the price however, it is important to note, that forecasted prices should not be used as a sole guide to make an investment decision without further analysis.

Implementation Plan

Step 1: Work on the missing data.

Step 2: Preparation of training set

Step 3: Preparation of test set

Step 4: Selecting, building, and evaluating the LSTM model.

Step 5: Interpreting the results.

Ethical Assessment

Cryptocurrencies are not subject to centralized control. One of the most important ethical issues for governments and academics about cryptocurrencies is the absence of regulation and a central authority that is answerable. It's a key factor in why numerous nations have outlawed cryptocurrencies. Customers have access to a payment mechanism using cryptocurrencies that can get through institutionalized regulatory procedures. As a result, the payment system has created a setting that is ideal for unlawful behavior. It seems that the primary means of payment for illicit behavior is cryptocurrency.