Title : Live Cryptocurrency Price Prediction

Team Members :
Arun Venkatesh : avenk013@ucr.edu | arun-venkatesh | https://github.com/arun-venkatesh
Ponmanikandan Velmurugan : pvelm001@ucr.edu | PonmanikandanV | https://github.com/PonmanikandanV

Motivation and Background :
The motivation behind choosing such an area for the project is:
1. We have prior experience in working with historic data, and hence we wanted to expand with live data processing.
2. Cryptocurrency is a rapidly changing commodity that has its own challenges and we are intrigued by it.
3. Make best use of the practices taught in the lectures and labs to obtain a high practical knowledge of the process.

Datasets :
Every Cryptocurrency Daily Market Price Dataset - Link
Cryptocurrency Historical Prices Dataset - Link
CoinMarketCap Live API - Link - Documentation

Description:
We are planning to dive deep into the concept of data analysis by working on a combination of both historical and live data. The former will be obtained through datasets from Kaggle and the latter will be through the free API that is provided by CoinMarketCap. We will also embed deep learning frameworks such as MLPs and LSTMs (subject to change) to achieve higher accuracy and to exploit the load of the data that cryptocurrencies offer.

The following are the information that are provided by the datasets:

1. This dataset provides us with high point, low point, starting value, closing value, and transaction volume for each day for 2020 - 2021 year.
2. This dataset also provides us with the same variable as above but for the 2017 - 2018 year.
3. The CoinMarketCap API has specific endpoints that would give us the live data, and we are planning to hit it every minute, due to pricing reasons.

The historic data obtained from the above gives us the information on various parameters such as highest value, lowest value for a particular day about cryptocurrencies. The live API will give us a neatly formatted JSON response that will contain all the necessary information as the historical data. We will convert that to a data frame that can accommodate all the information together which we will train and test our model on.

With that, we plan to provide the following analysis:

1. Visual representation of the actual vs the predicted data along with the deviation rate
2. Best timeframe to invest in cryptocurrencies
3. The trend of cryptocurrencies over the years and explain interesting discrepancies, if any

At the end of this project, we would have trained the model based on the historical data obtained, keep polling the API for latest cryptocurrency values and compare it with our predicted value. We will also display the predicted and actual values of our model along with the deviation rate to give a better understanding of the output.

Milestones/ Steps:

1. Gather historical dataset and perform extensive cleaning
2. Write a python script to dynamically fetch live values of cryptocurrencies through REST APIs
3. Convert the datasets from the above to be of uniform structure
4. Perform exploratory data analysis to identify latent patterns, trends and provide visualizations
5. Train a prediction model using deep learning frameworks and Test it using the CoinMarketCap live services API