REPORT

KHARAGPUR DATA SCIENCE HACKATHON

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To load the dataset, we installed the historic_crypto library which interacts with the CoinBase API to return the historical data of Bitcoin in a pandas dataframe.

We extracted the data from 01 Jan 2018 to 31 Jan 2022 for our model. We used 6-hour time interval dataset, because it preserves the autocorrelation.

On the dataframe we performed rolling mean and standard deviation calculations (low, high, open, close, and volume) of bitcoin price data. It uses different rolling windows(3 days, 7 days, and 30 days) to aggregate and the smoothen the data.

We used FB Prophet algorithm to train and fit the model (data from 2018-01-01 to 2021-08-01 for training and 2021-08-01 to 2022-01-31 for testing) because the data is non stationary and we know that FB Prophet does not have the requirement for the dataset to be stationary. The Mean Absolute Error score for our FB Prophet model was **954.50** and the Root Mean Square Error for model was **1253.94.**

Back-testing strategies were used on the historical data to calculate each strategy's percentage return on the investment. Results were visualized and incorporated in notebook and presentation.

It was found out that we are expected to gain approximately 2.85% using the strategy of buying if the price decreases for 2 periods and selling if it increases for five periods over the course of a month but there is more risk involved as well.

We also incorporated risk management strategies such as Risk to Reward ratio and stop loss mechanism. We created a function that calculates the ATR, determines the position size based on the risk per trade, sets the stop-loss level based on ATR, and initializes some variables for capital and risk per trade.

The code provides a framework for incorporating risk management into a trading strategy, allowing us to control the amount of capital at risk per trade and dynamically adjust position sizes based on market volatility.