



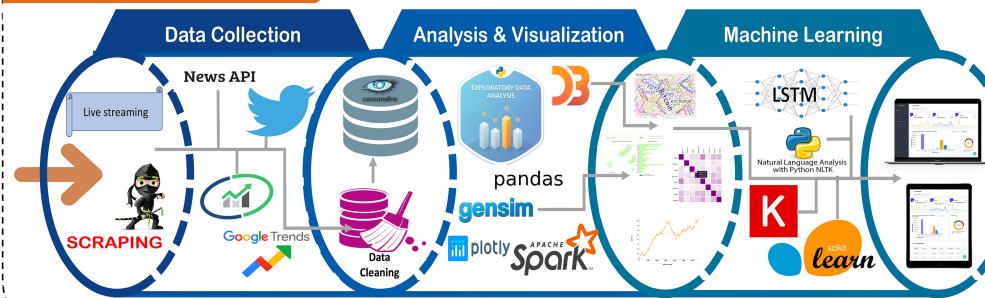
MOTIVATION

The economy is moving inevitably towards a digital ecosystem—the new and the most volatile digital currency is cryptocurrency. We analyzed the google trends data over the years and the price of cryptocurrency and we found out that both of them are resonating with each other. With the increasing interest of people in cryptocurrency markets, cryptocurrency will be the next prominent currency in the world. It can also be seen that major banks like Citibank, financial institution like JP Morgan and technological giants like Google and IBM have started investing in the blockchain and cryptocurrency technology, therefore a paradigm shift in the financial transactions is towards the digital ledger internal to the system itself.

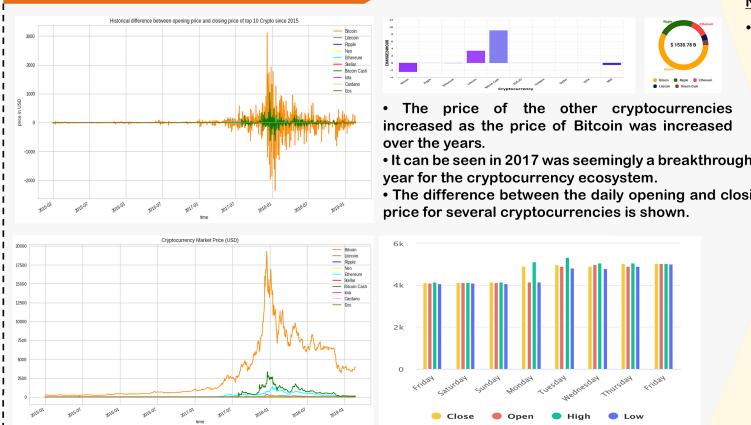
Several people have a difficult time gaining insights about cryptocurrencies—whether to buy or sell a cryptocurrency, what is the present price of cryptocurrencies or what is the rest of the world is thinking about that cryptocurrency. According to our findings, there is no one stop web dashboard that can answer all the questions related to cryptocurrencies.

We propose to answer all the questions related to cryptocurrency so that people are well informed about what is happening in the cryptocurrency market thus helping them in making an informed decision about the cryptocurrency of their choice.

DATA SCIENCE PIPELINE



INITIAL FINDINGS FROM EDA



VISUALIZATIONS

- Live sentiment analysis of tweets corresponding to Bitcoin and Ethereum across the globe.
- Multivariate analysis using Pearson, Spearman and Kendall correlation matrices measuring the strengths association between top 10 cryptocurrencies
- Live transaction nodes showing the concentration of reachable Bitcoin nodes found in countries around the world.
- On go interactive word cloud on the latest news articles on the crypto ecosystem.
- Topic Modeling using LDA visualizing the top most relevant topics related to cryptocurrency news.



GOALS

- Understanding the price and transaction behavior of the cryptocurrency market.
- Predicting the future price of major cryptocurrencies using historical data.
- Forecasting the future price based on News polarity for top cryptocurrencies.
- Build interactive web front to visualize live fluctuations, Order L2 snapshots, global transaction nodes reachable worldwide, social media analysis and explore the effects of different parameters on cryptocurrency prices.

BUILDING A ONE-STOP INTERACTIVE WEB FRONT FOR VISUALIZING:

- Live fluctuations of prices
- Order L2 snapshots
- Embed future price predictions from both numerical and sentiment data
- Market trade of cryptocurrencies around the world
- Global nodes reachable worldwide for transactions
- Social media analysis for the crypto world
- Stream latest news buzz specific to top cryptocurrencies

Data Collect: Collected data from various sources like NewsAPI, Twitter API, Crypto compare and google trends by implementing multiple scraper modules.

- Data Cleaning and Storing:** The data was then cleaned by filtering, removing null values, stemming, stop-words removal and then large amounts of data were converted to JSON and CSV formats and then stored in Cassandra.
- Analysis:** performed various live and interactive analysis on the data like word cloud, topic modeling, correlation matrix and sentimental analysis of various cryptocurrencies using D3, gensim, plotly.
- Machine Learning:** Predicted the price of various cryptocurrencies based on the historical OHLCV data using LSTM trained via Keras.
- Interactive Dashboard:** Incorporated the results in an interactive dashboard which consists of findings and insights that could help in getting various information about cryptocurrency.

SUPERVISED LEARNING TIME-SERIES MODEL

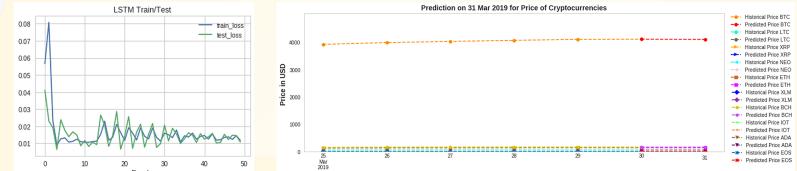
NUMERICAL DATA MODEL

- For forecasting the future average price of the top ten cryptocurrencies such as Bitcoin, Bitcoin Cash, Cardano, Ethereum, EOS, IOTA, Litecoin, NEO, Ripple, Stellar.
- We used the LSTM (Long Short Term Memory) model, a type of RNN from Keras neural-network library and ADAM Optimizer to train the model.
- The model was trained on price data containing close, high, low, open, volumefrom, volumeto, and an average weighted price which was calculated as an average of close, high, low and open.
- We trained/validated over 50 Epochs showing training/validation Mean Absolute loss for each.

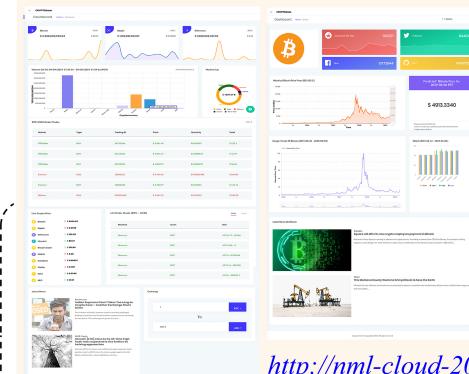
NUMERICAL DATA + NEWS SENTIMENT MODEL

- The model for predicting future price using news article as a feature was done after calculating the sentiment of each new article and the averaged value of sentiment polarity for each day for BitCoin along with numerical data was used to train the sentiment model.

Precision: 0.62, Recall: 0.57, F1 Score: 0.60, Mean Squared Error: 0.05



INTERACTIVE DASHBOARD



CONCLUSION:

CRYPTOIntel provides a deeper understanding of the major cryptocurrencies by taking into consideration of various aspects like prices, sentiments from the live news etc. Using these visualizations along with the information like the trends and future price of cryptocurrencies buyers will be able to make a sound decision. CRYPTOIntel is a one-stop solution for all the information related to the cryptocurrencies, designed in such a manner that it will aid the curious people looking out to gain knowledge about the cryptocurrency market and thus making an impact on various strata of the society.