Project Report

Description of the project

The website displays five different currencies, Bitcoin, Litecoin, Ripple, Ethereum and EOS where is possible to see in the graph their rates in pounds from a determinate date and their predicted rates in the future generated by machine learning with caption name in the graph as Mean.

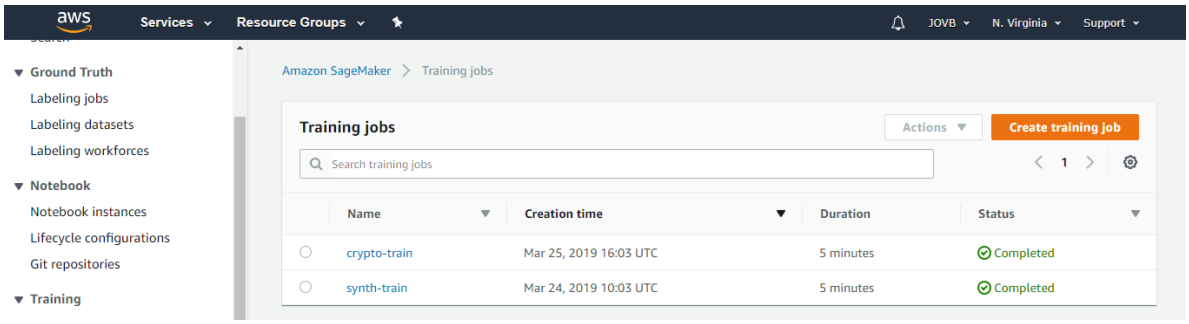
Also, it is possible to see the sentiment of each currency, where the user will see the percentage of positive, negative or neutral comments from the twitter.

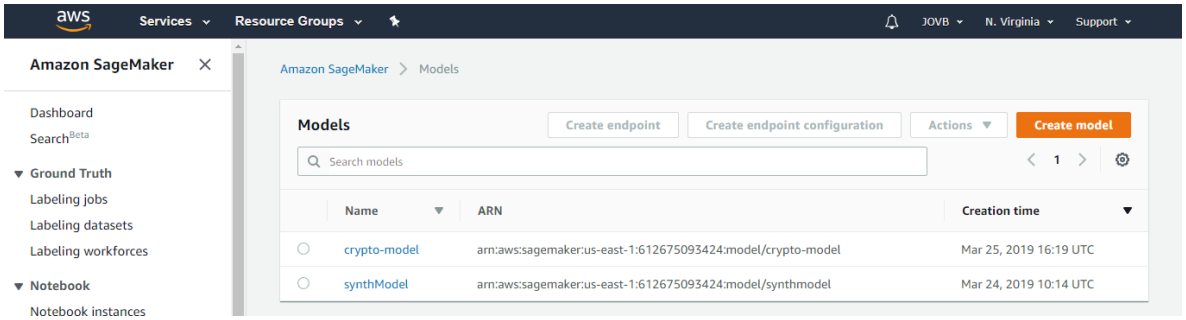
In another page, a synthetic data graph is presented with values from the determinate date and then predicted values generated by machine learning is also presented with caption name in the graph as Mean

Machine Learning

For the predictions of each currency and the predictions of the synthetic data, machine learning from Amazon has been used to calculate the rate.

For the machine learning, training job has been done first with data gathered from the API, then a model and endpoint have been created.





Sentiment Analysis

For the sentiment analysis, a resource from Amazon has been used the Comprehend. The text needs to be provided to the comprehend function, and then it will output a result of text inserted checking if it is positive, negative, neutral or mixed.

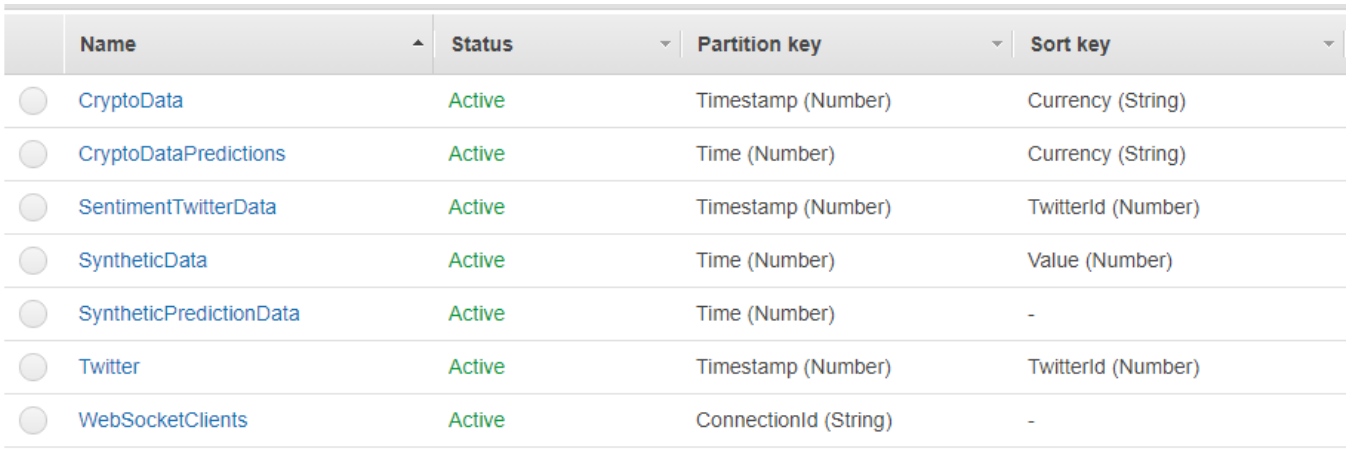
So, I have lambda function where a new tweet is inserted to DynamoDB,and it will trigger the sentiment Analysis lambda function where it will analyze the sentiment of the tweet. The result will be added to a new table in the DynamoDB and then will push this new data to the user using the WebSocket.

Lambda functions

SentimentAnalysis	Lambda function triggers when a new tweet is saved in DynamoDB, and then it checks the sentiment of the tweet and saves the result in a new table.
SyntheticPrediction	Giving the last 100 values, and using an endpoint for the synthetic data, this lambda function will save the predicted values into the DynamoDB.
cryptoPrediction	Giving the last 100 values for each currency, and then using an endpoint for the crypto data, this lambda will function save the predicted values into the DynamoDB.
wsConnect	Lambda function that is called when a client connects to API Gateway. Extracts client's connection ID from the event. Stores connection ID in DynamoDB.
wsDefault	Lambda function is triggered whenever a message is sent to a route that is not recognized. Should handle $default and return an error.
wsMessage	is triggered when the website is launched and when a new data gets saved in the SentimentTwitterData or CryptoData tables. Also, it gets connection Ids from DynamoDB. Send the data of the cryptocurrencies, sentiment and the synthetic data to clients through API Gateway. Moreover, deletes disconnected clients from DynamoDB.

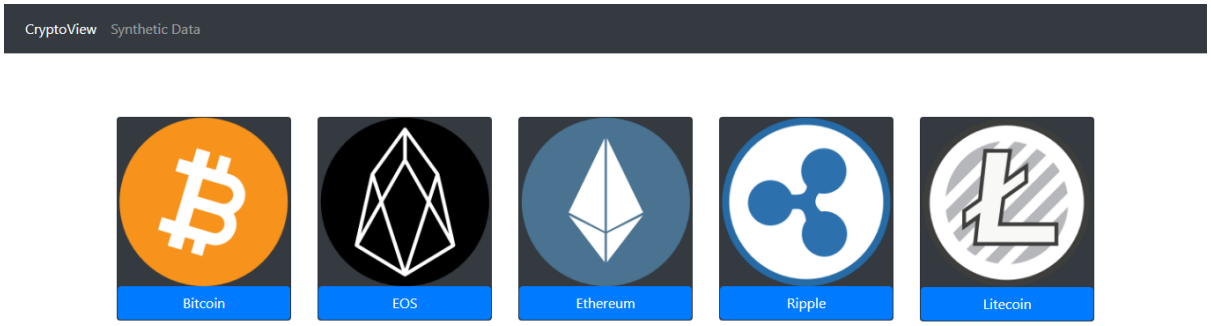
Database

Name	Function	Partition Key	Sort Key
CryptoData	Stores the rates of each currency from the API	Timestamp (Number)	Currency (String)
CryptoDataPredictions	Stores the predicted rates from the machine learning of each currency	Time (Number)	Currency (String
SentimentTwitterData	Stores the sentiment of the tweet	Timestamp (Number)	TwitterId (Number)
SyntheticData	Stores the synthetic values from the API	Time (Number)	Value (Number)
SyntheticPredictionsData	Stores the predicted values of the synthetic data	Time (Number)	
Twitter	Stores the tweets of each currency	Timestamp (Number)	TwitterId (Number)
WebSocketClients	Stores the connection ID	ConnectionId (String)	

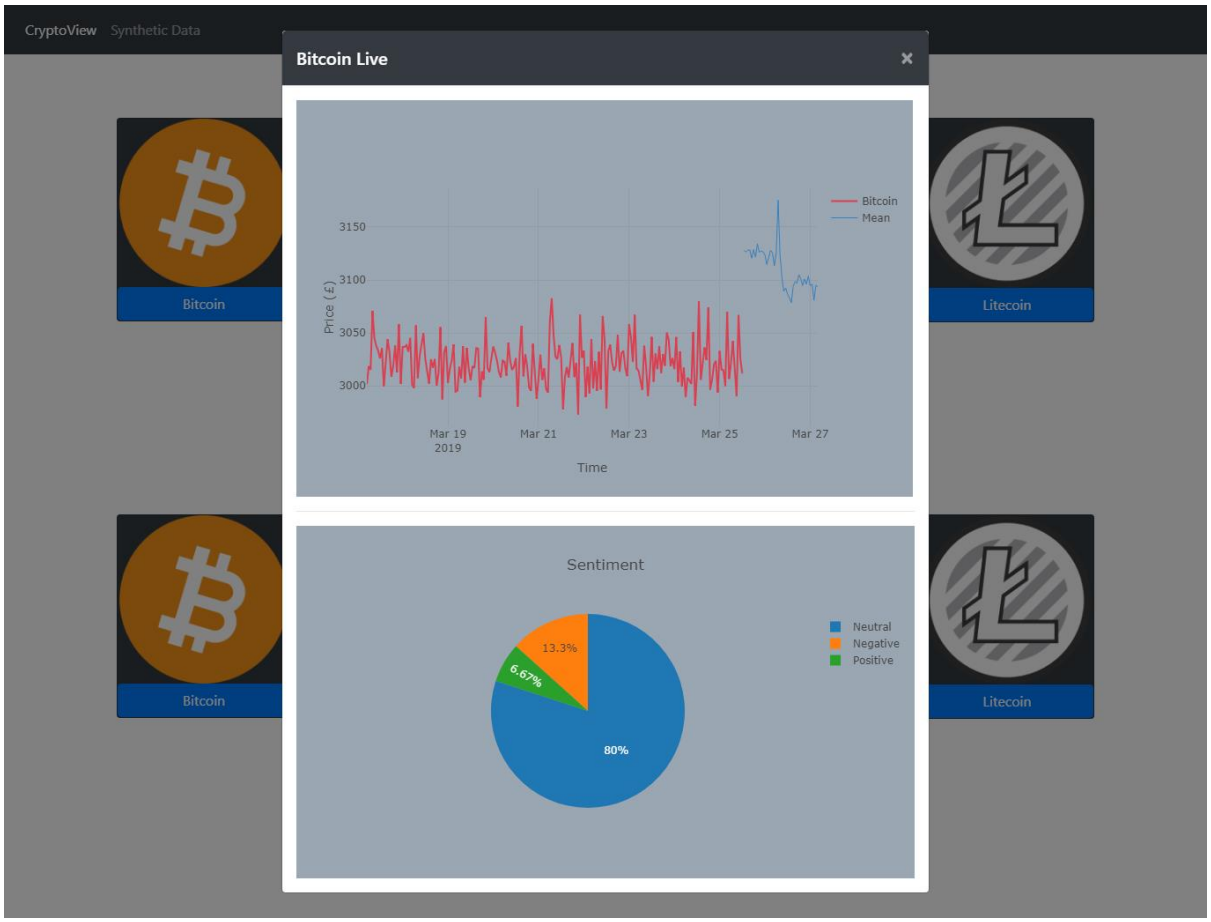


Name	Status	Partition key	Sort key
CryptoData	Active	Timestamp (Number)	Currency (String)
CryptoDataPredictions	Active	Time (Number)	Currency (String)
SentimentTwitterData	Active	Timestamp (Number)	TwitterId (Number)
SyntheticData	Active	Time (Number)	Value (Number)
SyntheticPredictionData	Active	Time (Number)	-
Twitter	Active	Timestamp (Number)	TwitterId (Number)
WebSocketClients	Active	ConnectionId (String)	-

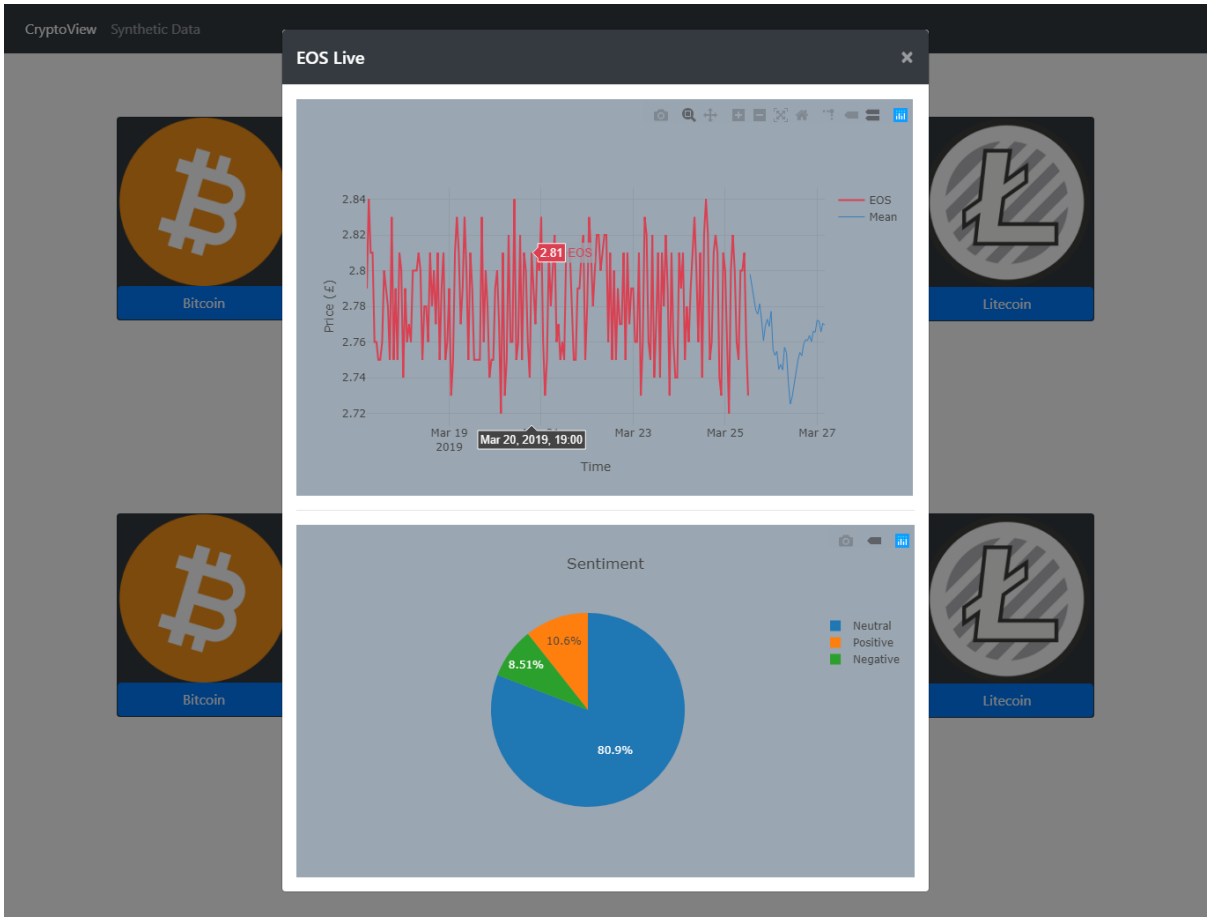
Homepage



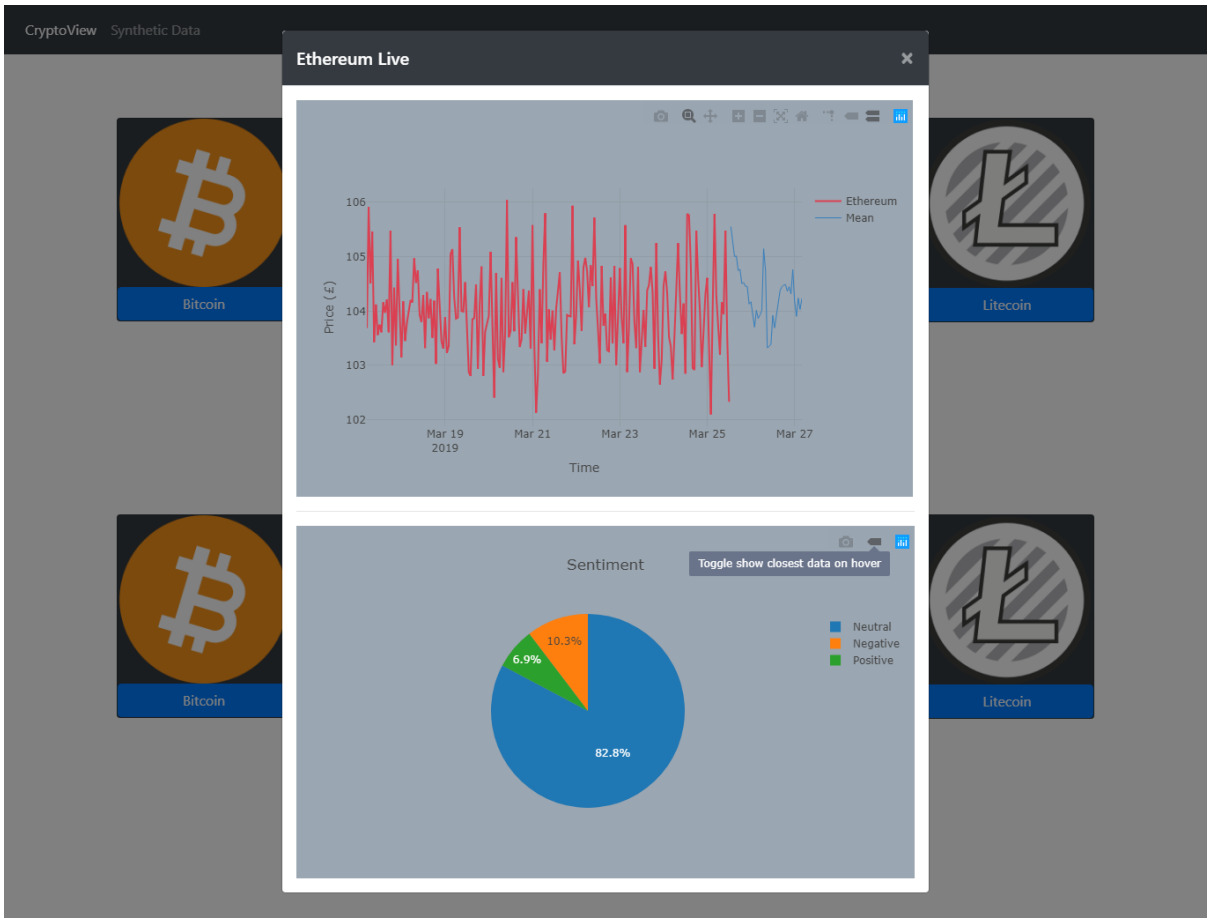
Bitcoin



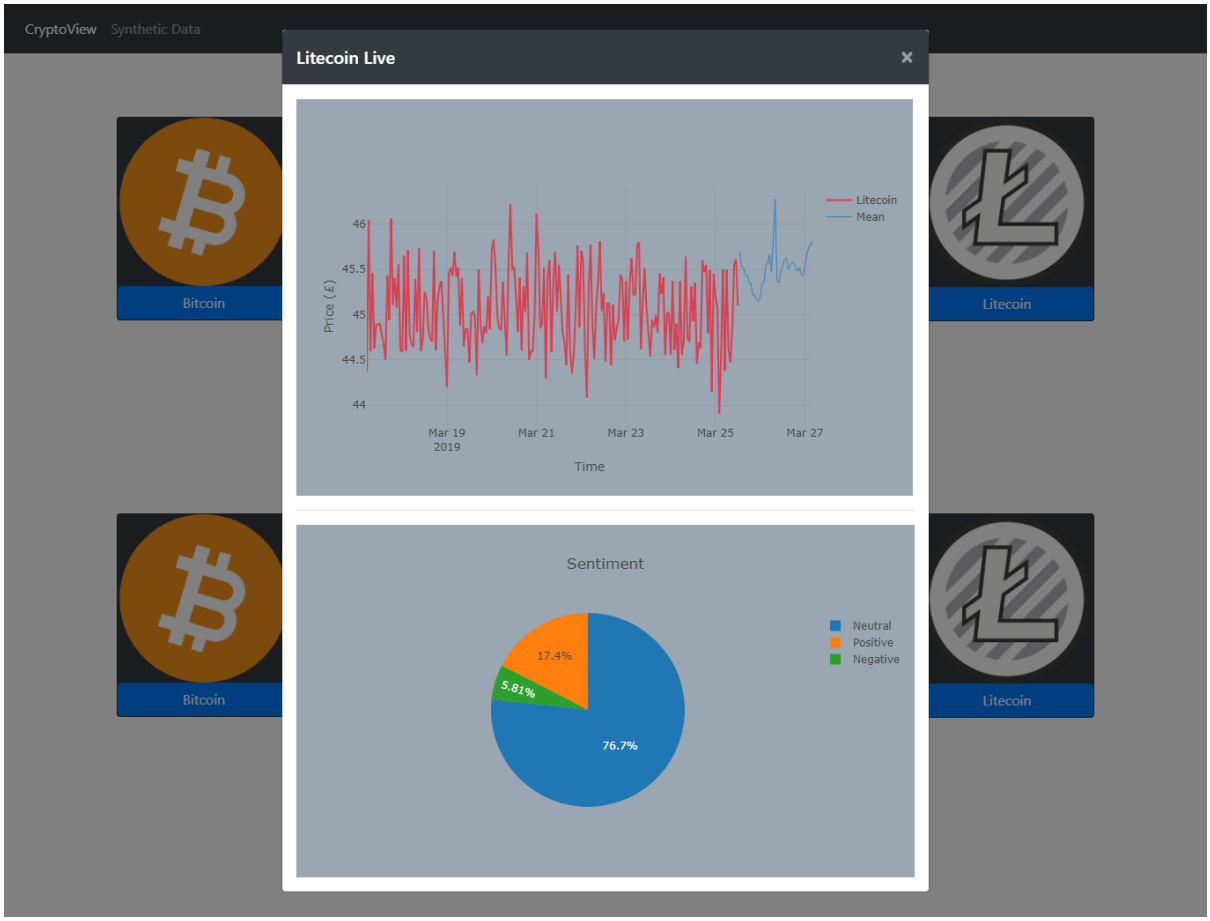
EOS


CryptoView
Synthetic Data
EOS Live
Bitcoin
Litecoin
Bitcoin
Litecoin
EOS
Mean
2.84
2.82
2.8
2.78
2.76
2.74
2.72
Price (£)
2.81
EOS
Mar 19
2019
Mar 20, 2019, 19:00
Mar 23
Mar 25
Mar 27
Time
Sentiment
Neutral
Positive
Negative
10.6%
8.51%
80.9%

Ethereum

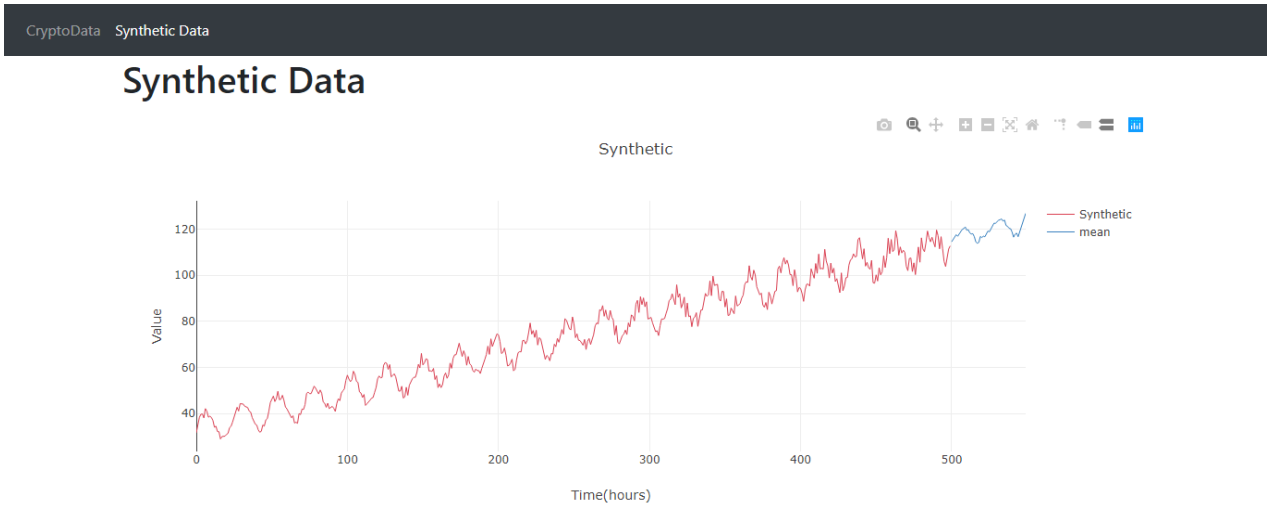

CryptoView
Synthetic Data
Ethereum Live
Bitcoin
Litecoin
Bitcoin
Litecoin
Ethereum
Mean
Price (£)
106
105
104
103
102
Mar 19
2019
Mar 21
Mar 23
Mar 25
Mar 27
Time
Sentiment
Toggle show closest data on hover
Neutral
Negative
Positive
10.3%
6.9%
82.8%

Litecoin


CryptoView
Synthetic Data
Litecoin Live
Litecoin
Mean
Price (£)
46
45.5
45
44.5
44
Mar 19
2019
Mar 21
Mar 23
Mar 25
Mar 27
Time
Sentiment
Neutral
Positive
Negative
17.4%
5.81%
76.7%
Bitcoin
Litecoin
Bitcoin
Litecoin

Ripple

Synthetic Data page



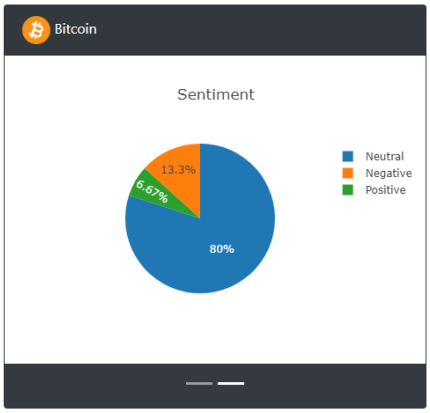
Another Website

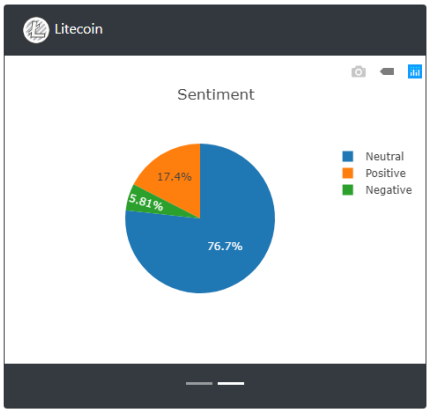
Homepage

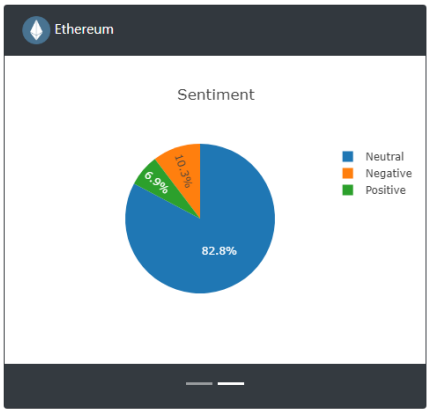
Cryptoview

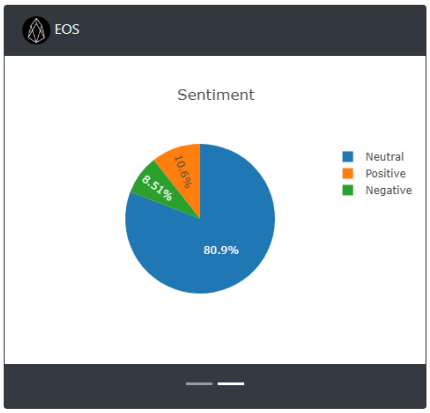
The sentiment of four currencies

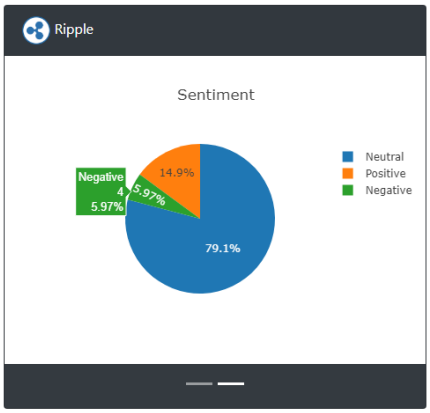
CryptoView Synthetic Data





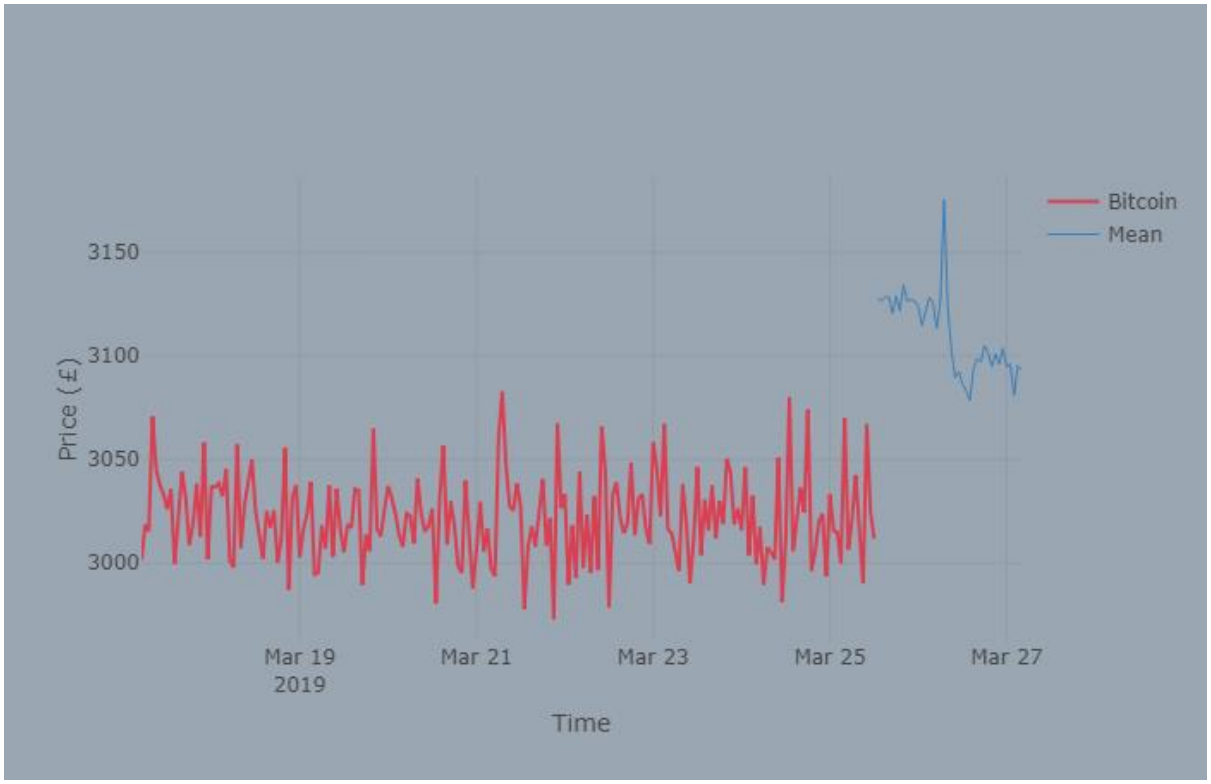




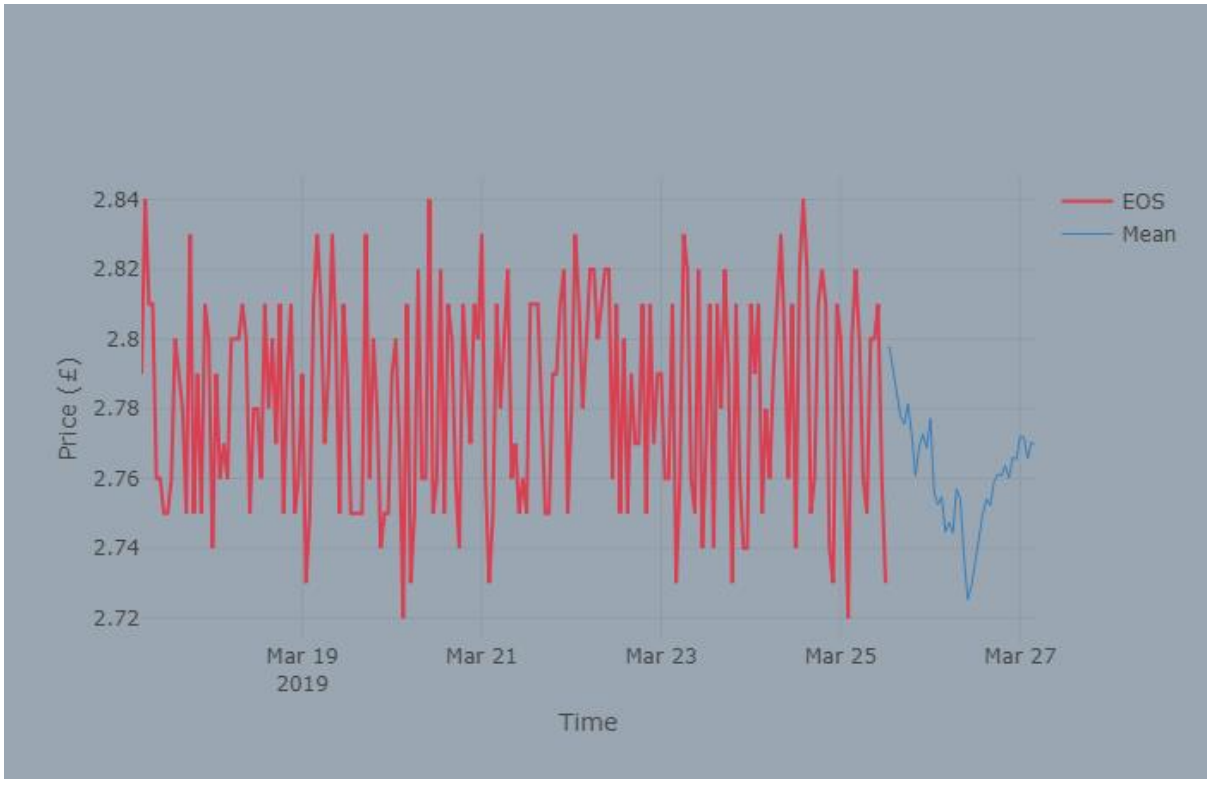


Data visualization

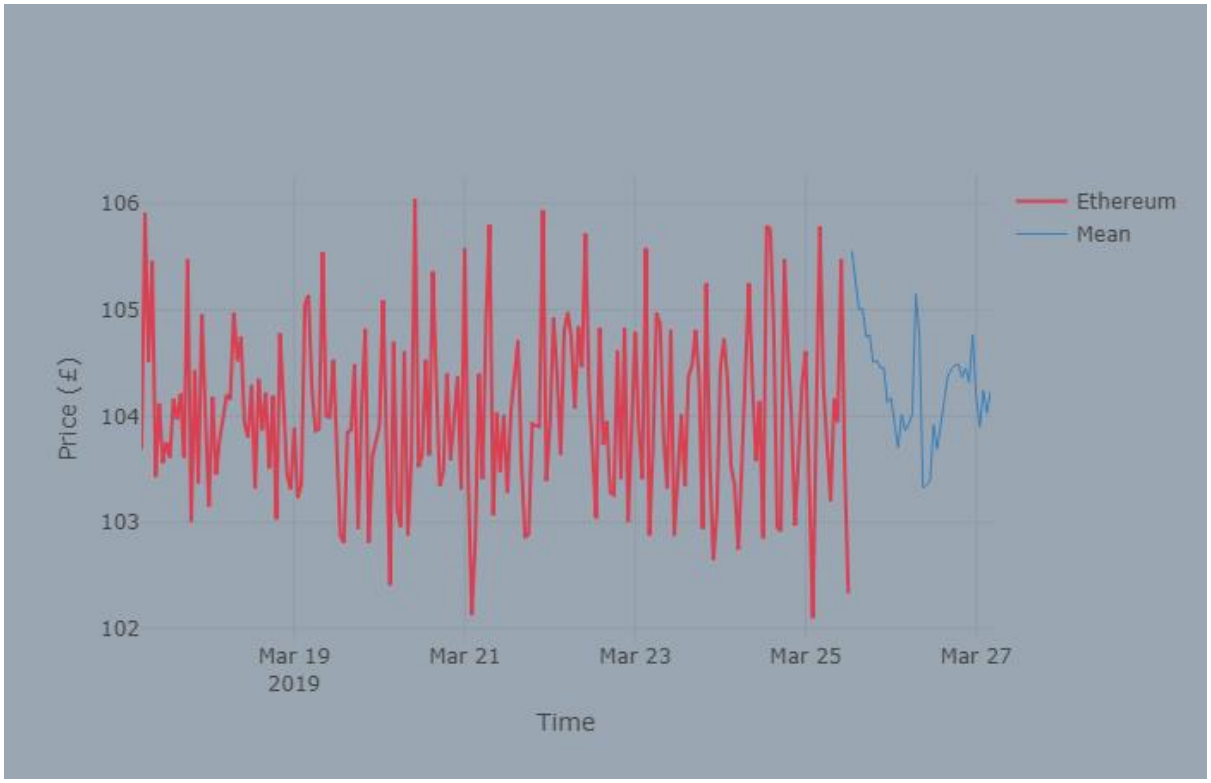
Bitcoin Data and Prediction



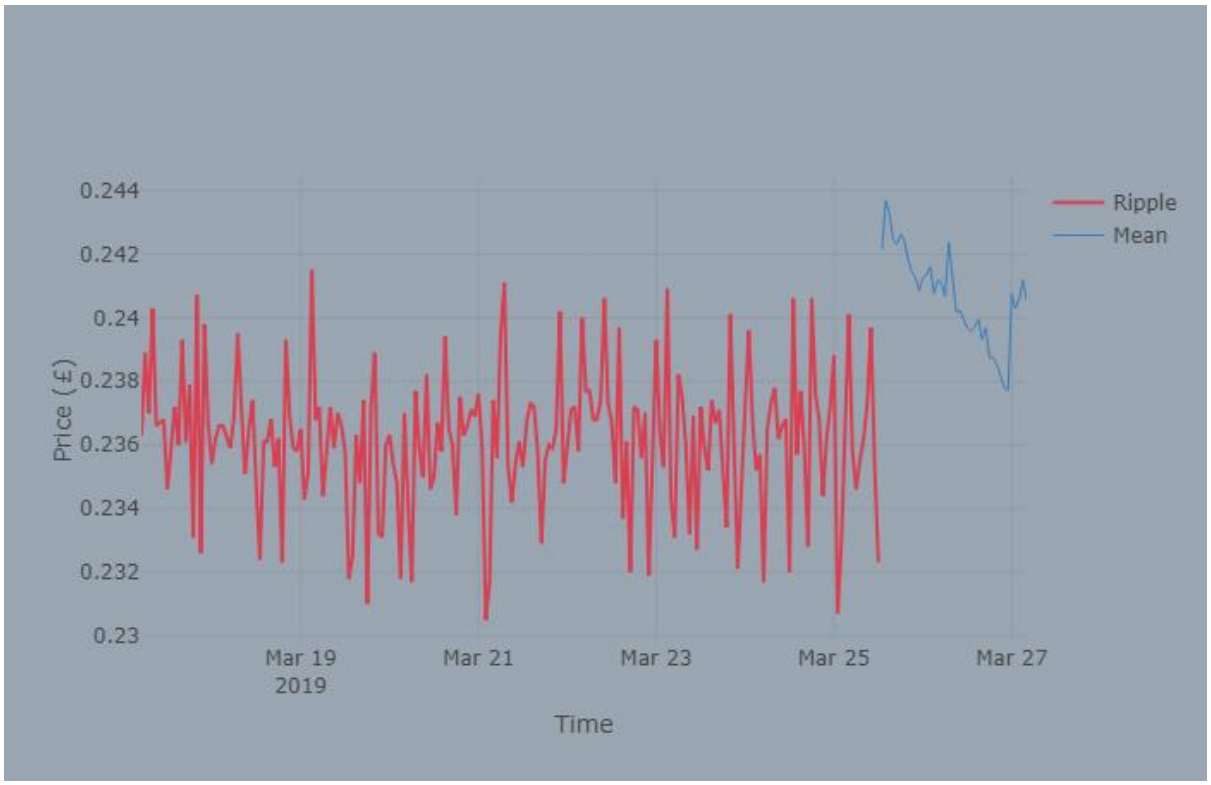
EOS Data and Prediction



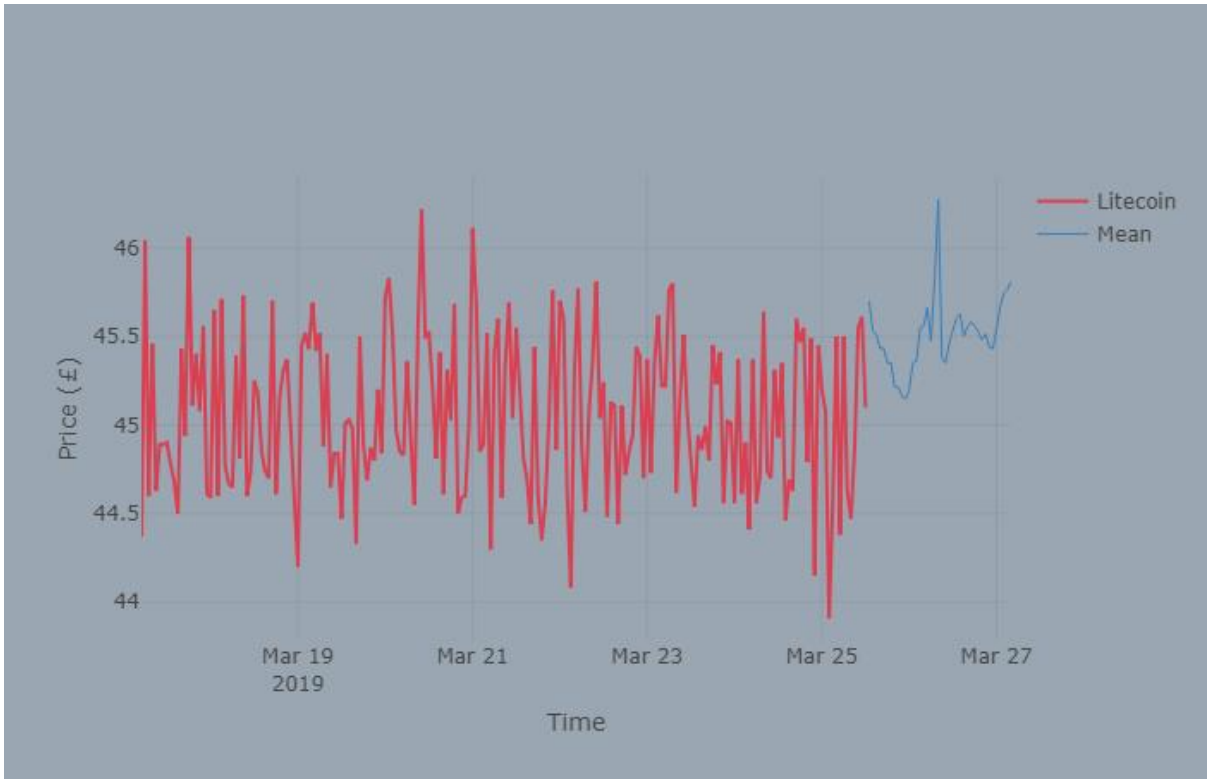
Ethereum Data and Prediction



Ripple Data and Prediction



Litecoin Data and Prediction



Synthetic Data