**ASSIGNMENT FOR DATA ANALYTICS**

**Cryptocurrency Market Capitalization and Comparison**

Summited by: Abusomwan Amadevborho

1. **Introduction**

Cryptocurrency, an encrypted, peer-to-peer network for facilitating digital barter, is a technology developed eight years ago. Bitcoin, the first and most popular cryptocurrency token, is paving the way as a disruptive technology to long standing and unchanged financial payment systems that have been in place for many decades (DeVries, Peter. 2016). This project using the crypto-markets.csv dataset aims to delve deep into the market capitalization and comparison of cryptocurrencies by analysing the following factors:

* Analyse cryptocurrencies trends using our attributes.
* Relationship between Bitcoin, Altcoin, and other high value coins in our dataset.
* Analyse the significant sub-set of data with the use of relevant charts.
* Forecast the market cap of crypto currencies token with necessary predictions with summary evaluations

**2.0 Individual Attributes**

This is a large time series csv file with 13 column and 942,297 rows. The dataset consists of various attributes, and we would be focusing more on the “markets”, “open”, “close”, “low”, “high”, “spread”, “rank”, “close-ratio” etc which we would be exploring during this project. This is a time series dataset ranging from 28-04-2013 to 21-02-2018 at various “date”. Moreover, the crypto-markets dataset has a good attribute with zero missing values, this can be seen in table 1.

Table 2a, shows the “market” cap prediction of cryptocurrency token. The “market” was set as the label in this table so we can analyse and make prediction for the dataset. Looking at table 2b, we used the “high”, “low”, “close-ratio” and “spread” as explanatory variables, predictors, covariates, or regressors variable while running the multiple linear regression to predict or forecast the market cap in the crypto-markets, this is explained further in using Formula 1. Apart from this, using a subset from our dataset with focus on market prices when it is “high” and “low” also how the market prices spread across the market which can be elucidated in Fig 2.0. Nonetheless, the “market” nominal value and the predicted value is expected due to the increase in the demand of cryptocurrency. the market cap increases with time, and these attracts investors in the cryptocurrency market, using the market attributes to make prediction

In addition, “rank” is another important attribute looking that we have various “slug”, “name” and “symbol” arranged in order of the “market” demand or valuation giving the fact that some token have more valuation and demand than the other. The “open” and “close” attributes also suggest gives details of the market opening price and also the closing price at a specified “date”.

**3.0 Groups of Attributes**

Looking at small number we apply the logarithm model to our market value so we can illustrate the line chart from fig 1.1 this chart below we can simply identify that bitcoin has the highest market cap compared to the other coins which are being listed on our data set. However, we can also see that dogecoin which came into the market as a meme coin has the competitive potential and also have a good market cap compared with other alt coin. Fig 1.1 also shows the amount of market valuation of daily cryptocurrency purchases and without a doubt the trends show us that “Bitcoin” should be tagged as the most priced crypto currency token operating in the competitive market. In addition to this the market value of “Bitcoin” surpasses other alt coin, however using our survey and findings we can also see the rapid increase in the market cap of alt coins especially “XRP” and “Ethereum”. This trends in Fig 1.1, shows the high demand and interest for cryptocurrency by people and we can project that as the demand in market increases with time, it should become a legal tender which can be used as means of payment of debt without any restriction or financial regulation(explained better in 4.0).

Furthermore, using our data set we rank the various cryptocurrency in order of demand. Given the illustration in fig 1.0 we can clearly see the order of ranking which BTC “slug” comes first because it has the highest market cap and also the highest demand followed by other altcoin such a ripple, Ethereum, stellar, bitcoin cash, eos, Litecoin, tether etc on the other hand, we can also see the market upsurge Dogecoin which is just a meme coin. Above all, looking at the trend in Fig 1.1, Bitcoin is the topmost priced and valued coin with a consistent increment in market cap compared to other altcoin.

Fig 2.0 shows the market spread in comparison when the price is high and when the price is low the blue colour indicates when the market price for cryptocurrency is high, while the colour green indicates when the price for cryptocurrency token is low, the orange colour in chart is the spread of cryptocurrency and this cuts across the price trends when it is high and low and can be clearly seen in our chart in fig 2.0. Nevertheless, the difference when a price of cryptocurrency is high and when the price of cryptocurrency is low is displayed as the spread.

Finally, Fig 2.2 shows an illustration with a line chart of the market price trends when market opens in contrast to when the market close given a date . The blue line indicates the opening market price while the green line in the chart shows the price cryptocurrency closes at a particular date.

**4.0 Interesting Findings**

First and foremost, an interesting finding we can see in Fig 2.0, shows that there is a rapid increase in the price of cryptocurrency, the price of a cryptocurrency is increasing compared to when it is low. We can conclusively say that Bitcoin which is the highest-ranking cryptocurrency as seen in Fig 1.0 is a good return on investment over a period. It should be noted, investment in cryptocurrency over the year has shown a rapid increase and demand given the fact it is an unregulated currency mainly to trade for profit and secure online transaction. However, the high demand and the steady purchase over time, we can say cryptocurrency is the future and with time will become a legal tender. Also, knowing this market trends beforehand gives investors a valuable insight if the cryptocurrency market is either a bull or bear market.

Secondly, Using the line chart in Fig 2.2 we can see that the blue line which indicates the price when the market open cuts across the price which the market closes. Moreover, from our observation looking the line chart in Fig 2.2 we can say that the purchasing power when the market opens is more compared to when the market closes, therefore it is more profitable to purchase crypto currency when the market opens and with these insights or trends behaviour, investors will know the best time to invest.

Thirdly, given the illustration in Fig 3, Table 2a and 2b can be used for forecasting or prediction in the context of time series analysis, we could see interestingly that market cap prediction using the multiple linear regression increases with time, therefore we can conclusively say that the market cap of cryptocurrency will have a continuous increment over time. Predictions was made possible using different operators that can be seen in Fig3. The crypto-market dataset was imported before selecting a subset of five (5) variables from the dataset. The variables include “close\_ratio”, “high”, “low”, “spread” which is the explanatory variables, predictors, covariates, or regressors variable and thereby making the “market” as label to make prediction of the crypto market. 70% of the dataset was used for training in our multiple linear regression model while the remaining 30% of the dataset was set as a model for testing so as to make predictions as seen in Table 2a using the rapid miner. We also measured the performance of our model by using the performance operator seen in fig 3

Last but not least, we notice a negative relationship of the market cap when the price value of crypto currency is high as seen Table 2b “High” having a negative coefficient shows it is inversely related. This can be explained that when the price of crypto currency is high, there would be a decrease in the market demand and vice versa. For example, people would prefer investing and purchasing cryptocurrency when there is a reduction in the price compared to when the price is high and in return investors will get more from purchasing at a lower price and selling at a higher price to make profit. This can be expressed in the linear regression formula below:

*Formula1*.

Y= B0 + B1X1 + B2X2+ B3X3 + B4X4

Y= 118020611.376 + (- 14094043789.751). high +(14094051556.185). low + (130921692.823).close\_ratio +(14094037289.944).spread

Where, variable Y is the dependent variable, and the X variables are known as the explanatory variables, predictors, covariates, or regressors variable.Above all, we noticed our predictive value in Table 2a, is more than the actual market value. This shows that there would be lot more profitability investing in cryptocurrency. The p value from our findings, having a unit of 0 means it is a good predictor (less than 0.5).

**Appendix 5 Pages**

**I)Source of Dataset**

The dataset “crypto-markets.csv” was used in this project. The was accessed using the

url: <https://www.kaggle.com/jessevent/all-crypto-currencies> from Kaggle dataset website at [www.kagle.com](http://www.kagle.com)**.**

**II) Application**

We also made use of the Rapid Miner studio 9.10 for our analysis, prediction, and visualization

Table 1: *Statistics of dataset*

**Table

Description automatically generated**

**Graphical user interface

Description automatically generated with medium confidence**

Fig 1.0 *Ranks of Cryptocurrency*

Graphical user interface

Description automatically generated with medium confidence

Fig 1.1: *Market Comparison trends of Cryptocurrency*

Chart

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Fig 2.0: *Comparison of Market high, low and spread (scatter/bubble)*

Chart, scatter chart

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Fig 2.2*: Open and Close Market trends*

Chart, line chart

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Fig 3: *RapidMiner link of operators*

Diagram

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Table 2a: *Market prediction using market as label*

*Table

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Table 2b*: Linear regression of summary statistics*

A screenshot of a computer

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Referencing list

DeVries, Peter. (2016). An Analysis of Cryptocurrency, Bitcoin, and the Future. International Journal of Business Management and Commerce. Vol. 1. Pages 1-9.