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ECON 4980: Machine Learning

Midterm Write-up and Analysis

Using two websites, coinranking.com and coinmarketcap.com, the program I created was able to provide a dataset that gave us certain information like market capitalization, the price at the time, the growth rate over the past 24 hours and the week, etc. Using this information, I was able to perform several different types of analysis to compare how the two websites are similar and how they are different. This both includes how the numbers could vary between the two based on their ranking choice as well as how the factors associated with certain variables have different effects on the currency’s characteristics.

First, I’d like to present two graphs side by side that show the correlation between the size of the market capitalization and the growth rate over the past 24 hours. Although there are not extremely large amounts of data, it can be seen in coinmarketcap that the currencies with larger market capitalization seem to have much lower growth rates than the ones with smaller market capitalization. The reason this assumption can be made is due to the nature of cryptocurrencies and other market trading that shows that larger currencies/companies/commodities don’t increase or decrease as largely as a smaller one would.

Additionally, in the graph below, the coinranking website and graph show a very similar conclusion. That the market capitalization seems to have an impact on how much the cryptocurrency grows. In this assumption, we also need to understand that there are outliers and not every currency will follow this trend due to the sporadic and irregular nature of cryptocurrencies.

In addition to factors the correspond to certain variables on the site, the websites differ greatly in the way information is displayed and given to the user. On coinranking.com, it is evident that the website is directed more towards quick, less advanced crypto buyers due to the limited amount of information about each currency in terms of both history and its current state. Whereas, coinmarketcap gives a very detailed report of how certain currencies were formed, its highs and lows over several time periods and a general about section that tells the user a little more about what each one is. Overall, coinmarketcap is definitely geared towards more advanced crypto buyers.

When looking at some general summary statistics, it can be seen that when the coinmarketcap prices are all summed and average it results in 232.08 and when the coinranking prices are all averaged it results in 224.18. This means that there are obviously different numbers being reported to each site. The fact that the average is off by 10 is actually large when considering how the data is being scaled (billions). Additionally, when all the growth rates are averaged from coinranking it gives us 6.903875 whereas when we average all the growth rates over the past 24 hours from the coinmarketcap site we get 7.386626 which means that in both cases coinranking is lower in growth rate average and price average. We can conclude that it might be in the best interest of the user to consider both sites and possibly average between the two to ensure they are receiving information from a site that tends to be higher and one that seems to be lower to receive the most accurate results.

Lastly, I decided to attempt to perform a linear regression on the price and how it is affected by the market capitalization. Using the same file, but changing the dataset.csv file, it is possible to create a machine to learn the correlation between the price and market cap. When the linear regression is performed using the coinranking site and using new values for the market capitalization, the corresponding prices are given to us below. However, when the regression is performed using the coinmarketcap site, the result is the list of values below the first.

[4268.67545911, 4124.02916121, 3979.38286331, 3979.38286331]

[180.85109309, 180.8505758, 180.85005851, 180.85005851]

This linear regression was performed by entering four new values that represent progressively increasing market capitalizations. The file then performs the regression and predicts the previous values. The first group of values from coinranking seems to be much higher than the values we receive as a result from coinmarketcap. In addition, both values are decreasing which means that we can assume the price will decrease as the market capitalization gets higher according to our regression. Furthermore, the second set of values form the coinmarketcap site shows us a much smaller decrease in values than doe the coinranking website which could conclude that market capitalization doesn’t seem to effect price as much on coinranking as it does on the coinmarketcap website.