

Information Visualization

Project Report Team- 0's and 1's

TITLE - Visualization of Top 100 Cryptocurrencies

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ABSTRACT :

We present a systematic review of visual analytics tools used for the analysis of blockchains-related data. Blockchain technology has recently received considerable attention and spurred applications in a variety of domains.

In its simplest form, blockchain is a vast and complex series of transaction events between entities and a cryptocurrency is a tool used to implement these transactions. Those events – or connections – are easier to understand when they're presented in an interactive, tangible format since a large amount of textual data isn't enough to gain insights into a specific domain and is tough for mere human comprehension so we'll be at a better position to comprehend and prioritize.

In this project, we systematically and quantitatively assessed four properties of cryptocurrencies - Market Capitalization, Price, Circulating supply & volume; then we displayed the top 100 in each category as output using D3 visualization techniques.

THEORY :

1. CRYPTOCURRENCY INTRODUCTION

A cryptocurrency or crypto, is a virtual currency secured by cryptography. It is designed to work as a medium of exchange, where individual ownership records are stored in a computerized database.

The defining trait of a cryptocurrency is that they are not issued by the government agency of any country, making them immune against any interference and manipulation from them.

2. CHARACTERISTICS OF A CRYPTOCURRENCY SYSTEM

As per computer experts, any system that falls under the category of cryptocurrency must meet the following requirements.:

- Absence of any centralized authority and is maintained through distributed networks
- The system maintains records of cryptocurrency units and who owns them
- The system decides whether new units can be created and in case it does, decided the origin and the ownership terms
- Ownership of cryptocurrency units can be proved exclusively cryptographically.
- The system allows transactions to be performed in which ownership of the cryptographic units is changed.

3. ADVANTAGES OF CRYPTOCURRENCY

- Funds transfer between two parties will be easy without the need of third parties like credit/debit cards or banks
- It is a cheaper alternative compared to other online transactions
- Payments are safe and secured and offer an unprecedented level of anonymity
- Modern cryptocurrency systems come with a user “wallet” or account address which is accessible only by a public key and private key. The private key is only known to the owner of the wallet

- Funds transfer is completed with minimal processing fees.

4. DISADVANTAGES OF CRYPTOCURRENCY

Cryptocurrencies have the following disadvantages.

- The almost hidden nature of cryptocurrency transactions makes them easy to be the focus of illegal activities such as money laundering, tax-evasion and possibly even terror-financing
- Payments are not irreversible
- Cryptocurrencies are not accepted everywhere and have limited value elsewhere due to some governments not legalizing crypto transactions
- There is concern that cryptocurrencies like Bitcoin are not rooted in any material goods. Some research, however, has identified that the cost of producing a Bitcoin, which requires an increasingly large amount of energy, is directly related to its market price.

5. RECENT DEVELOPMENTS - Cryptocurrency in India

On December 7 2021, Finance minister Nirmala Sitharaman asserted that the proposed Central Bank Digital Currency will not boost cryptocurrency in India.

However, in her budget speech in April 2022, Finance Minister Nirmala Sitharaman announced that the digital rupee or CBDC would be issued by the RBI in the coming fiscal year. Flagging concerns over likely misuse of crypto, she has said India will take a considerate decision on regulation around the virtual currency.

OBJECTIVES OF THE PROJECT :

1. To extract the dataset from *coinmarket* API which contains the details of cryptocurrencies and their transactions
2. To show the implementation of D3 visualization techniques and bubble charts

3. To display the top 100 cryptocurrencies by market capitalisation in the form of bubble chart
4. To display the top 100 cryptocurrencies by volume in 24 hours
5. To display the top 100 cryptocurrencies by Price
6. To display the top 100 cryptocurrencies by circulating supply
7. To show the other details of a cryptocurrency like its name, rank, volume, circulating supply, market capitalisation inside a bubble no matter which variable is selected.

AUDIENCE :

1. Miners
2. Traders and investors in cryptocurrencies
3. Researchers and Developers in the field of blockchain
4. Firms and corporations
5. Venture capitalists and entrepreneurs

DATASET :

The dataset used for the project shows the data about the top 100 cryptocurrencies by market cap as of June 4, 2021. The dataset is in .csv format but we convert it into an array for the sake of simplicity during visualization. Each crypto data is stored in an object, and a sample object is shown below:

```

data = ▼Array(100) [
  0: ▼Object {
    symbol: "BTC"
    market_cap: "694710143345"
    cmc_rank: "1"
    name: "Bitcoin"
    market_capClean: "$694,710,143,345"
    volume_24h: "41901139590"
    volume_24hClean: "$41,901,139,590"
    price: "37097"
    priceClean: "$37,097.48"
    circulating_supply: "187266"
    circulating_supplyClean: "187k"
  }
  1: ►Object {symbol: "ETH", market_cap: "312718946959", c
  2: ►Object {symbol: "USDT", market_cap: "62008610495", c
  3: ►Object {symbol: "BNB", market_cap: "60563191151", cm

```

PROCEDURE:

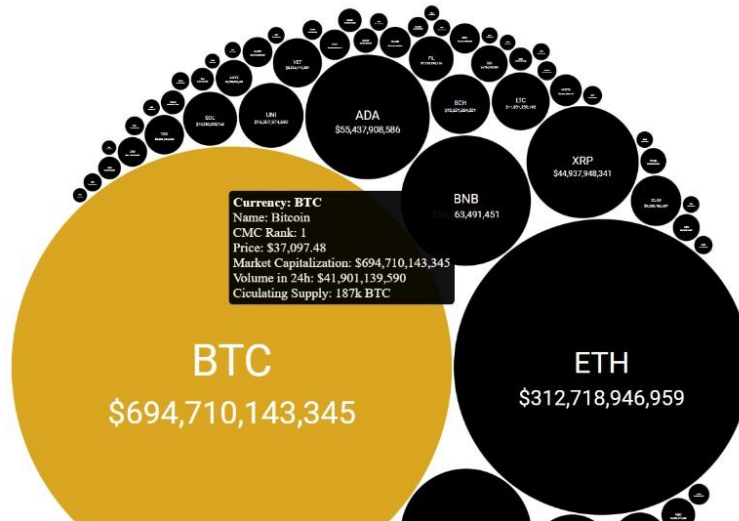
1. We first download the dataset from *coinmarketcap* and store it in a .csv format.
2. We make a simple HTML document and embed Javascript to run our d3.js code.
3. In the runtime.js file, we write the main logic of the code where we categorize data based on market cap, 24 hours volume, top crypto by price and top crypto by circulating supply.
4. Create a bubble graph and pass the parsed csv data into an array of objects.
5. Create radio button HTML elements to change the parameters.
6. Display the resultant bubble graph.

SCREENSHOTS OF EXECUTION:

1. Top 100 cryptocurrencies by market capitalisation

Variable

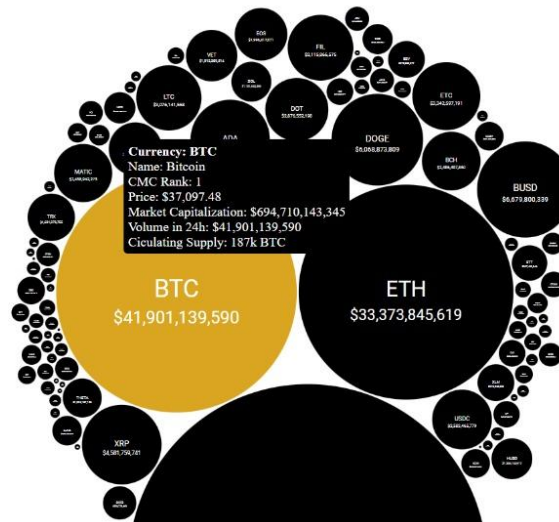
☒ Market Capitalization ☐ Volume 24h ☐ Price ☐ Circulating Supply
variable = "market_cap"



2. Top 100 cryptocurrencies by volume 24h

Variable

☐ Market Capitalization ☒ Volume 24h ☐ Price ☐ Circulating Supply
variable = "volume_24h"



Variable

☐ Market Capitalization ☐ Volume 24h ☒ Price ☐ Circulating Supply

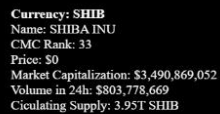
variable = "price"



Variable

☐ Market Capitalization ☐ Volume 24h ☐ Price ☒ Circulating Supply

variable = "circulating_supply"



RESULT :

Thus, all the mentioned objectives were executed successfully using D3 visualization techniques and the top 100 cryptocurrencies according to market capitalisation, volume 24h, price and circulating supply were displayed intuitively in the form of a bubble chart.
