Crypto Portfolio

GCA: Gryffindor Consulting Agency

Amir, Katya, Linh, Marc, Ricardo

Project Overview

This project analyzes the **correlations** among three cryptocurrencies: **Bitcoin, Ethereum, and Dogecoin**, by merging three datasets sourced from Kaggle.

Hypotheses:

1. Significant price drop / increase in Bitcoin lead to price drops in the major cryptocurrencies.

2. Increases in Bitcoin's trading volume are followed by increases in the trading volumes of other cryptocurrencies.

3. Bitcoin's market dominance has decreased over time compared to Ethereum and Dogecoin.

4. The volatility of Bitcoin is lower compared to other cryptos.

Data Acquisition and Examination

- We used three datasets from Kaggle and merged them into one: coin_bitcoin.csv, coin_ethereum.csv, and coin_dogecoin.csv.

- After merging the datasets, we cleaned the data to prepare it for analysis in SQL.

Merged database:

|	sno	name	symbol	date	high	low	open	close	volume	marketcap
0	1	Bitcoin	BTC	2013-04-29 23:59:59	147.488007	134.000000	134.444000	144.539993	0.000000e+00	1.603769e+09
1	2	Bitcoin	BTC	2013-04-30 23:59:59	146.929993	134.050003	144.000000	139.000000	0.000000e+00	1.542813e+09
2	3	Bitcoin	BTC	2013-05-01 23:59:59	139.889999	107.720001	139.000000	116.989998	0.000000e+00	1.298955e+09
3	4	Bitcoin	BTC	2013-05-02 23:59:59	125.599998	92.281898	116.379997	105.209999	0.000000e+00	1.168517e+09

Database Design: ERD (Entity-Relationship Diagram)
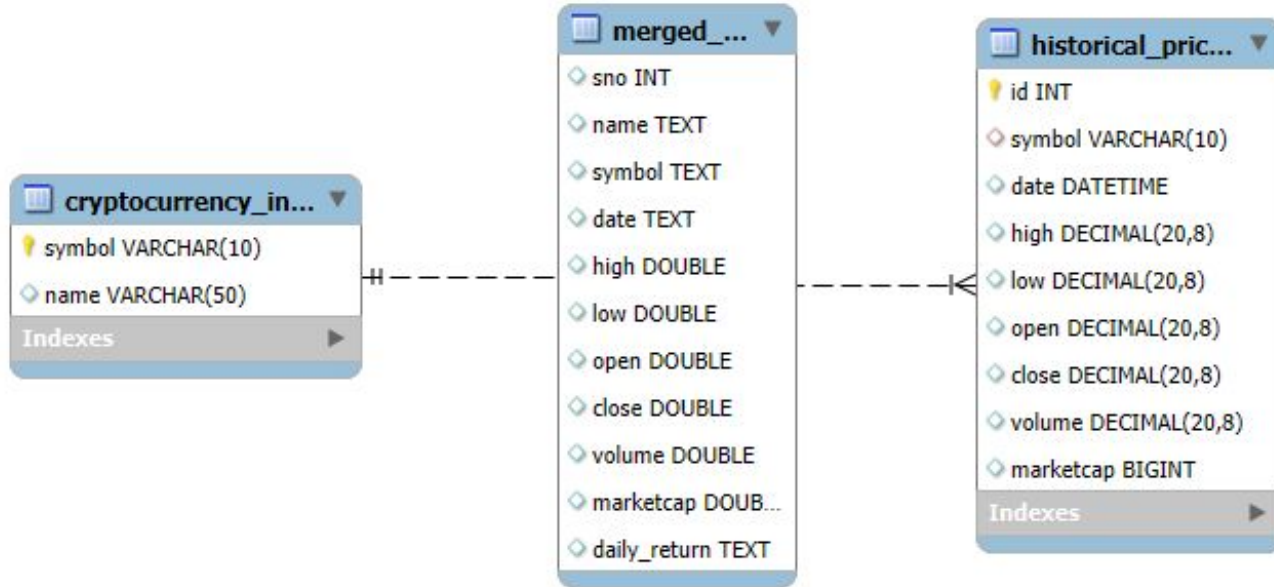
H1: Significant price drops & increases in Bitcoin lead to price drops & increases for other cryptocurrencies.

Insights:

- Significant Price Changes: When Bitcoin experiences significant price drops or increases, Ethereum and Dogecoin tend to exhibit similar price changes.

- Market Influence: This trend underscores Bitcoin's influence as a market leader, suggesting that traders often react to Bitcoin's volatility when making decisions about other cryptocurrencies.
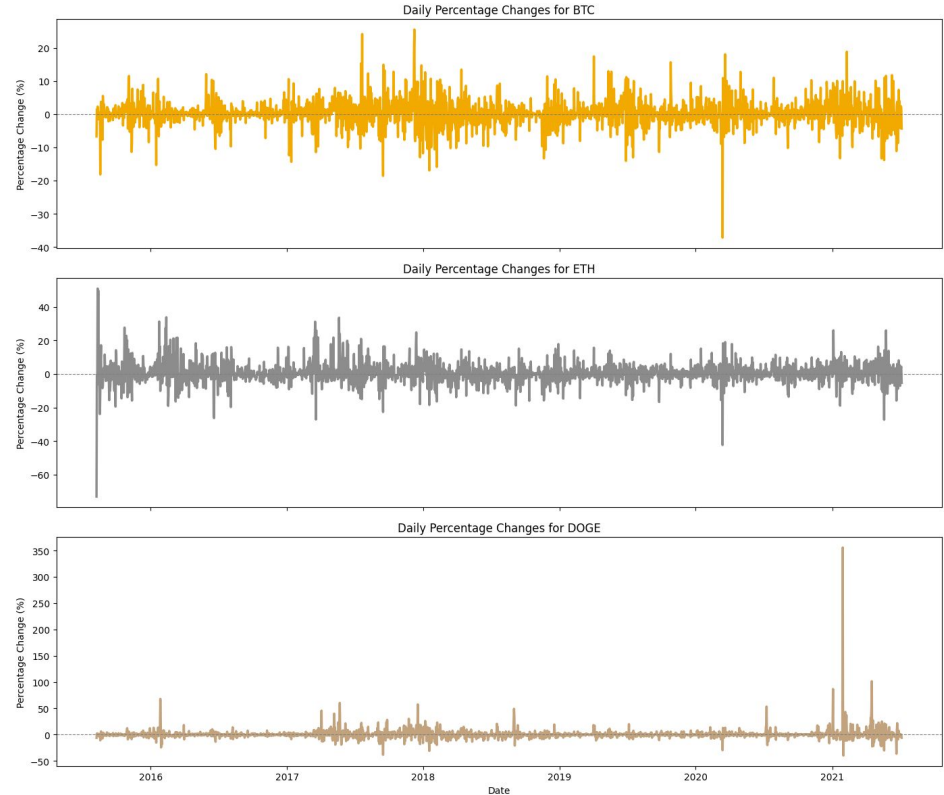
H2: Increases in Bitcoin's trading volume are followed by increases in the trading volumes of other cryptocurrencies.

btc_date	btc_volume_change	eth_volume_change	doge_volume_change
2015-08-11	21.23	261.01	78.95
2015-08-12	5.43	46.99	-43.79
2015-08-13	3.24	89.19	-8.95
2015-08-16	53.81	39.01	285.08
2015-08-18	94.96	-23.53	20.89
2015-08-19	44.42	0.04	66.22
2015-08-22	0.14	-53.08	-35.32
2015-08-24	221.74	-41.80	180.93
2015-08-25	3.16	41.33	10.03

rounded_volume_changes 66

- Utilized temporary tables in SQL to calculate percentage changes in volume.

- Created three distinct temporary tables for volume changes across various cryptocurrencies.

- Consolidated data into a single final table for comprehensive analysis.

H2: Increases in Bitcoin's trading volume are followed by increases in the trading volumes of other cryptocurrencies.


Cryptocurrencies changes overtime
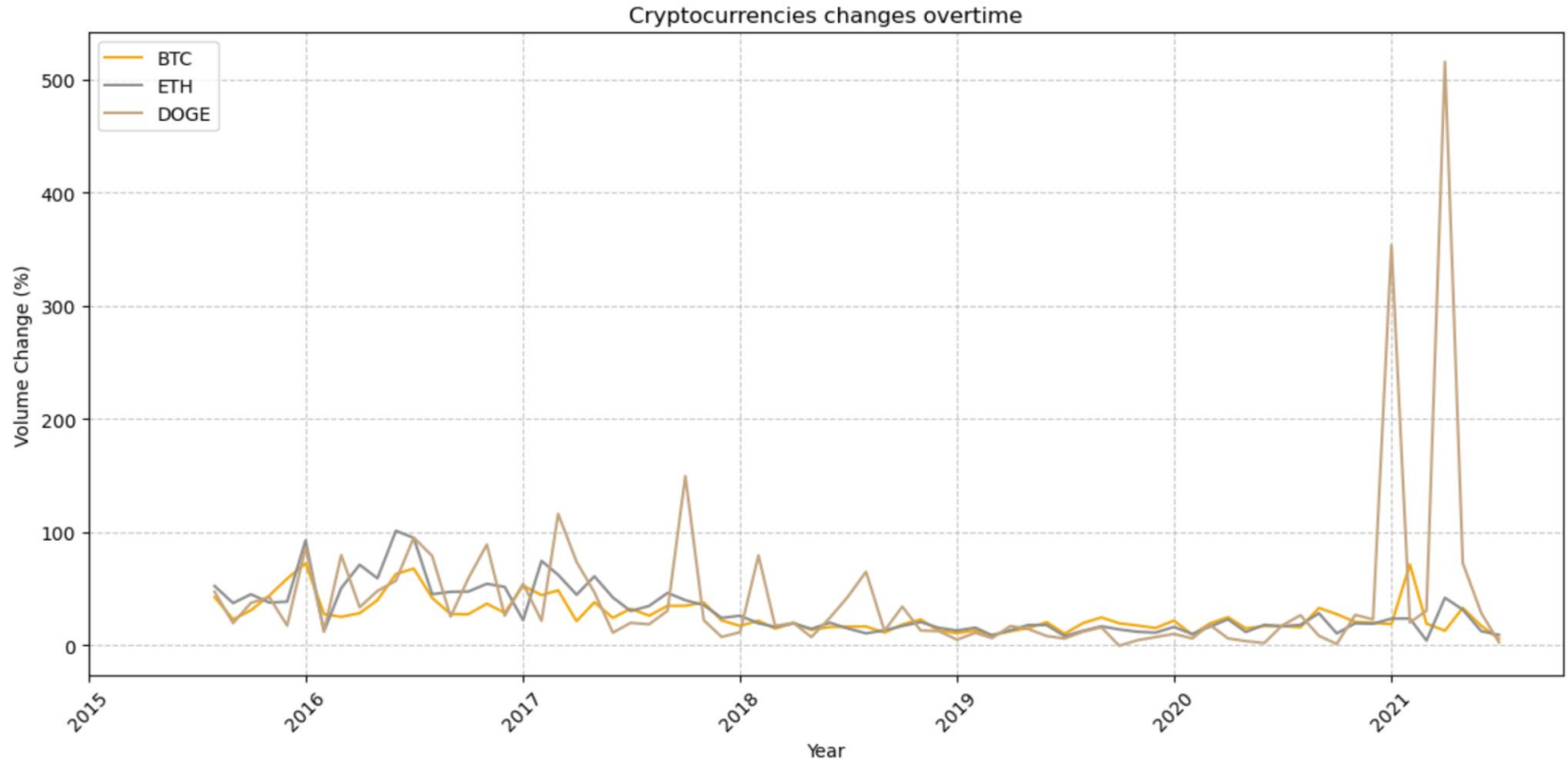
H3: Bitcoin's market dominance over Etherium and Dogecoin has decreased with time.

date	bitcoin_marketcap	total_marketcap	bitcoin_market_dominance
2017-06-17 23:59:59	43548031451.6	79037028287....	55.09826519922547
2017-06-18 23:59:59	41788418973.5	76541381349....	54.59585159878273
2017-06-19 23:59:59	42470734800	77094753779....	55.08900764029967
2017-06-20 23:59:59	44643512689	78258088789....	57.04651542034692
2017-06-21 23:59:59	44111929172.5	75678139916....	58.28886547846888
2017-06-22 23:59:59	44384244937.2	75910708257....	58.46901702797324
2017-06-23 23:59:59	45037797052.5	77075172861....	58.4335984995093
2017-06-24 23:59:59	42807952580.6	73179878313....	58.496889537691274
2017-06-25 23:59:59	42495001715.8	70958974667....	59.88671893170845
2017-06-26 23:59:59	40677994353.8	66290175781....	61.363533697753866

The total market cap for all three cryptocurrencies (Bitcoin, Ethereum, Dogecoin) was calculated, grouping by date to create a combined market cap for each day.
Using a JOIN between Bitcoin's market cap and the total market cap, Bitcoin's market dominance was calculated as a percentage.

H3: Bitcoin's market dominance over Etherium and Dogecoin has decreased with time.


Bitcoin Market Dominance Over Time
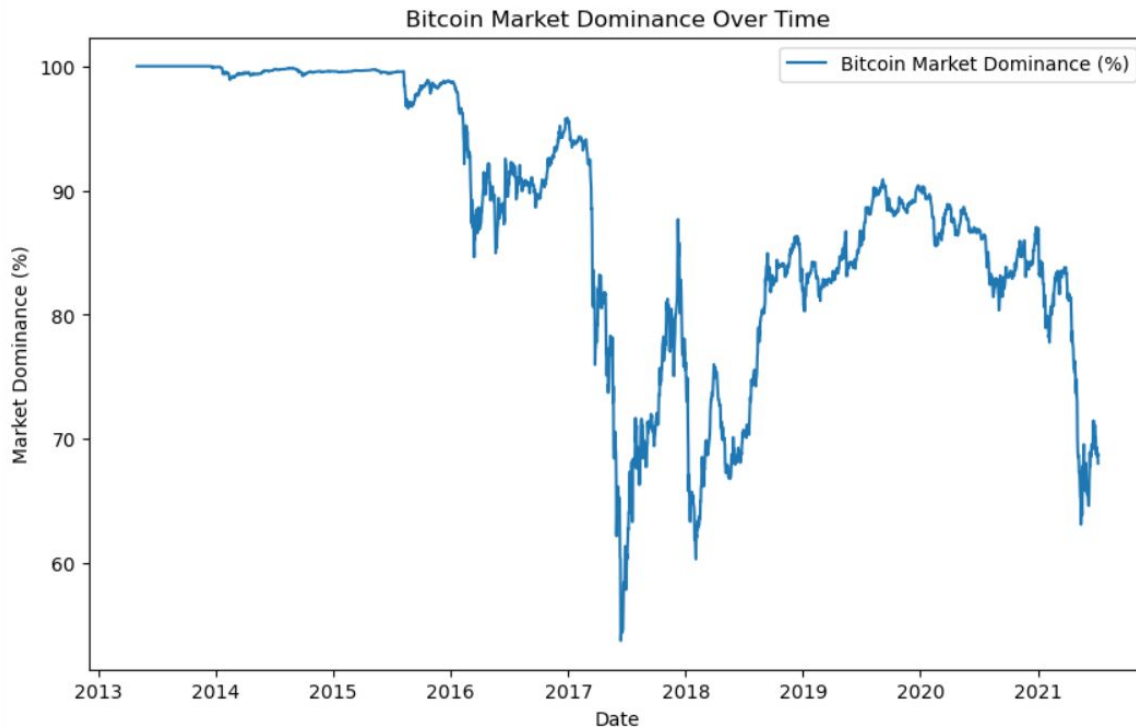
- Overall, the SQL query results show a decrease over time as the cryptocurrency market becomes more diversified.

- In 2017, Bitcoin's market dominance experienced a sharp decline.

- Ethereum saw tremendous growth during this period. Initial Coin Offering (ICO) enabled new projects to raise capital by issuing their own tokens, often built on the Ethereum blockchain.

- Other cryptocurrencies like Litecoin, Ripple, and Dogecoin started gaining market share.

H4: The volatility of Bitcoin is lower compared to other cryptos.

Cryptocurrency Volatility (2015-08-08 to 2021-07-06)
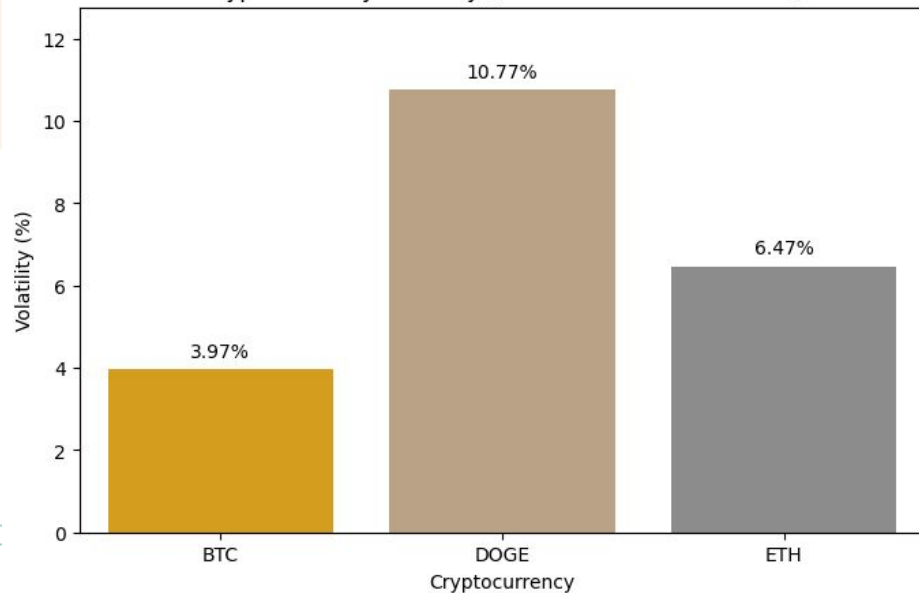
Distribution of Daily Percentage Changes (2015-08-08 to 2021-07-06)
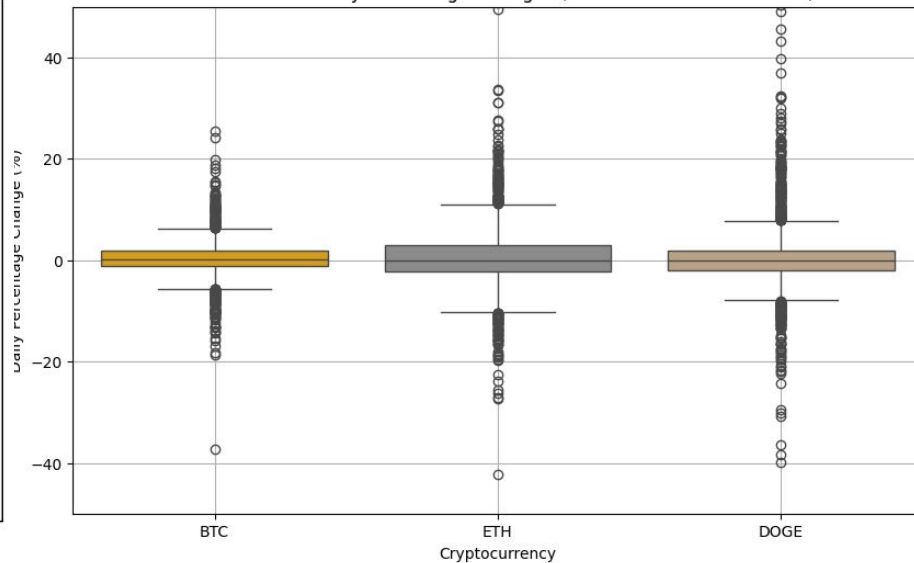
- Analysis Approach:
  - Volatility Calculation: Determine standard deviation of daily percentage changes for each cryptocurrency to measure volatility.
  - Graphical Insights: Bar plots and distribution analysis depict volatility levels.

- Insights:
  True to hypothesis, Bitcoin shows lower volatility than Ethereum and Dogecoin, suggesting a more stable investment relative to these altcoins.

Conclusions

-   There is a correlation between the volume increases of Bitcoin and the other cryptocurrencies; however, Dogecoin exhibits more extreme values due to its higher volatility.

-   Results show a decrease over time as the cryptocurrency market becomes more diversified.

-   It is recommended to invest in a range of cryptocurrencies beyond Bitcoin. This reduces the risk associated with any single asset's performance.

-   Bitcoin is relatively less volatile than other cryptocurrencies, more volatile assets like Dogecoin can offer higher short-term gains but also greater risk. Investors should allocate a larger percentage of their portfolio to less volatile assets like Bitcoin and Ethereum for stability.

Thank you!

Crypto Portfolio

GCA: Gryffindor Consulting Agency

Amir, Katya, Linh, Marc, Ricardo