CRYPTOCURRENCY DOCUMENTATION

1. Introduction

Cryptocurrencies have emerged as one of the most dynamic and fast-evolving financial instruments, attracting the attention of investors, traders, and technologists globally. Understanding market trends, historical performance, and making data-driven decisions in the cryptocurrency space requires the ability to interpret complex datasets effectively.

This project, titled "Cryptocurrency Dashboard," is a data visualization tool built using Power BI that leverages a comprehensive dataset from Kaggle. The dashboard provides insightful visual representations of key cryptocurrency metrics such as price trends, market capitalization, and trading volume. The primary aim is to deliver a user-friendly platform for analyzing cryptocurrency data without the complexity of live API integration, making it suitable for beginners, analysts, and financial researchers.

The project serves as a practical demonstration of data analytics and visualization concepts, focusing on how data from multiple cryptocurrencies can be organized, interpreted, and visually represented to provide meaningful insights. The dashboard empowers users to track historical performance, compare different cryptocurrencies, and better understand the volatility and growth trends in the market.

1.2 Problem Statement

In recent years, the proliferation of cryptocurrencies has created an overwhelming amount of data that can be difficult to analyze without proper tools. While several platforms offer real-time market data, they often fail to provide user-friendly or customizable visualizations. This complexity hinders users from extracting actionable insights, especially for those unfamiliar with technical data analysis. Additionally, most platforms that offer cryptocurrency tracking rely on real-time APIs, which can be limiting for those interested in historical data analysis or working with static datasets.

To address these challenges, this project focuses on using a static dataset from Kaggle to create a cryptocurrency dashboard. The aim is to provide simplified data visualization that allows users to explore trends, performance, and other key metrics without relying on external, live data sources or having to navigate complex interfaces. By focusing on static historical data, the project offers a stable environment for educational and analytical purposes.

•

1.3 Purpose/Objective and Goals

The objective of the Cryptocurrency Dashboard is to create a tool that simplifies the analysis of cryptocurrency data, particularly for users who may not have access to live data feeds or prefer working with historical data. The specific goals of the project include:

- *Data Visualization: To create clear and interactive visual representations of cryptocurrency price, volume, and market capitalization using Power BI.*

- *Ease of Use: To ensure the dashboard is user-friendly and accessible for users with varying levels of technical expertise.*

- *Comparison and Insights: To enable users to compare multiple cryptocurrencies and gain insights into their historical performance.*

- *Educational Tool: To provide a platform that can be used for educational purposes, helping users understand the trends and metrics that drive the cryptocurrency market.*

1.4 Scope of Project

- *Dashboard Development: The project aims to create a dashboard utilizing a Kaggle dataset with historical cryptocurrency data.*
- *Dataset Metrics: The dataset includes various metrics, such as price, market capitalization, and trading volume for multiple cryptocurrencies over a specified time period.*
- *User Interactivity: Users will have the ability to filter, compare, and visualize the cryptocurrency data in multiple ways.*
- *Current Scope: The focus is on static data analysis, providing users with insights into past trends without relying on live data feeds.*
- *Future Enhancements: The dashboard has potential for future upgrades, including integrating real-time data APIs and expanding the range of analyzed cryptocurrencies.*

-

2. System Analysis

2.1 Existing Systems

Several established platforms, such as CoinMarketCap and CoinGecko, offer detailed insights into the cryptocurrency market. These platforms provide real-time pricing, historical data, market capitalization, and various other performance metricsUsers are limited to predefined charts and tools, which may not meet the needs of those seeking a more tailored analytical experience.

2.2 Scope and Limitations of Existing Systems

- *Scope: Existing platforms cover a vast range of cryptocurrencies, offering real-time updates, historical data, and various performance indicators. They are highly suitable for professional traders who require constant updates on market conditions.*

- Limitations:

- *Complex for Casual Users: Many platforms are hard to use for people who aren't experts.*
- *Multiple Screens: Users have to switch between screens to compare different cryptocurrencies.*
- *Overwhelming Interfaces: Advanced tools can confuse users who don't know much about trading.*
- *Limited Historical Data: Most platforms focus on real-time data and don't emphasize historical analysis.*

2.3 Project Perspective and Features

- *The dashboard simplifies cryptocurrency data analysis for casual users and analysts.*

- *It features interactive charts that are easy to manipulate and customize.*

- *Users can compare multiple cryptocurrencies based on key metrics.*

- *The dashboard allows for in-depth analysis of historical price trends.*

- *Insights can be gained without relying on real-time data feeds.*

2.4 Requirement Analysis

- *Software Requirements: Power BI Desktop for dashboard creation.*

- *Dataset: Kaggle's cryptocurrency dataset containing historical data on various cryptocurrencies.*

- *Hardware Requirements: A machine capable of running Power BI and processing large datasets, with at least 4 GB of RAM.*

2.5 Functional Requirements, Performance Requirements, Security Requirements

- *The dashboard must allow users to filter and visualize cryptocurrency data effectively.*
- *It should provide insights into historical trends of the cryptocurrencies.*
- *Users must be able to compare different cryptocurrencies seamlessly.*

•

3. System Design

3.1 Design Constraints

The design is limited to the features and capabilities of Power BI. The dataset is static and does not update in real-time, limiting the scope of real-time analysis.

3.2 Data Dictionary

The cryptocurrency dataset comprises key attributes for analysis: Cryptocurrency Name (e.g., Bitcoin, Ethereum) and its Symbol for identification. Market Capitalization reflects the total market value, while Volume indicates trading activity. Each entry includes the Date of the data point, along with Open and Close prices representing the market's opening and closing values. Additionally, the High and Low values show the highest and lowest trading prices during the specified period, providing insights into market fluctuations.

Name	Symbol	Date	High	Low	Open	Close	Volume	Marketcap	Year	Average
Bitcoin	BTC	29-04-2013 23:59:59	$147.488006591797	$134	$134.444000244141	144.539993286133	0	$1,60,37,68,864.5	2013	140.744003295898
Bitcoin	BTC	30-04-2013 23:59:59	$146.929992675781	$134.050003051758	$144	139	0	$1,54,28,13,125	2013	140.48999786377
Bitcoin	BTC	01-05-2013 23:59:59	$139.889999389648	$107.720001220703	$139	116.98999786377	0	$1,29,89,54,593.75	2013	123.805000305176
Bitcoin	BTC	02-05-2013 23:59:59	$125.599998474121	$92.2818984985352	$116.379997253418	105.209999084473	0	$1,16,85,17,495.25	2013	108.940948486328
Bitcoin	BTC	03-05-2013 23:59:59	$108.127998352051	$79.0999984741211	$106.25	97.75	0	$1,08,59,95,168.75	2013	93.6139984130859
Bitcoin	BTC	04-05-2013 23:59:59	$115	$92.5	$98.0999984741211	112.5	0	$1,25,03,16,562.5	2013	103.75
Bitcoin	BTC	05-05-2013 23:59:59	$118.800003051758	$107.142997741699	$112.900001525879	115.910003662109	0	$1,28,86,93,175.5	2013	112.971500396729
Bitcoin	BTC	06-05-2013 23:59:59	$124.66300201416	$106.639999389648	$115.980003356934	112.300003051758	0	$1,24,90,23,060	2013	115.651500701904
Bitcoin	BTC	07-05-2013 23:59:59	$113.444000244141	$97.6999969482422	$112.25	111.5	0	$1,24,05,93,600	2013	105.571998596191
Bitcoin	BTC	08-05-2013 23:59:59	$115.779998779297	$109.599998474121	$109.599998474121	113.56600189209	0	$1,26,40,49,202.15	2013	112.689998626709
Bitcoin	BTC	09-05-2013 23:59:59	$113.459999084473	$109.26000213623	$113.199996948242	112.669998168945	0	$1,25,45,35,382	2013	111.360000610352
Bitcoin	BTC	10-05-2013 23:59:59	$122	$111.551002502441	$112.799003601074	117.199996948242	0	$1,30,54,79,080	2013	116.775501251221
Bitcoin	BTC	11-05-2013 23:59:59	$118.679000854492	$113.01000213623	$117.699996948242	115.24299621582	0	$1,28,42,07,489.42	2013	115.844501495361
Bitcoin	BTC	12-05-2013 23:59:59	$117.448997497559	$113.434997558594	$115.639999389648	115	0	$1,28,19,82,625	2013	115.441997528076
Bitcoin	BTC	13-05-2013 23:59:59	$118.698997497559	$114.5	$114.819999694824	117.980003356934	0	$1,31,57,10,010.5	2013	116.599498748779
Bitcoin	BTC	14-05-2013 23:59:59	$119.800003051758	$110.25	$117.980003356934	111.5	0	$1,24,38,74,487.5	2013	115.025001525879
Bitcoin	BTC	15-05-2013 23:59:59	$115.809997558594	$103.5	$111.400001525879	114.220001220703	0	$1,27,46,23,812.5	2013	109.654998779297
Bitcoin	BTC	16-05-2013 23:59:59	$118.76000213623	$112.199996948242	$114.220001220703	118.76000213623	0	$1,32,57,26,787	2013	115.479999542236
Bitcoin	BTC	17-05-2013 23:59:59	$125.300003051758	$116.570999145508	$118.209999084473	123.014999389648	0	$1,37,37,23,881.88	2013	120.935501098633
Bitcoin	BTC	18-05-2013 23:59:59	$125.25	$122.300003051758	$123.5	123.498001098633	0	$1,37,95,74,545.85	2013	123.775001525879
Bitcoin	BTC	19-05-2013 23:59:59	$124.5	$119.570999145508	$123.210998535156	121.98999786377	0	$1,36,32,04,702.75	2013	122.035499572754
Bitcoin	BTC	20-05-2013 23:59:59	$123.621002197266	$120.120002746582	$122.5	122	0	$1,36,37,09,900	2013	121.870502471924
Bitcoin	BTC	21-05-2013 23:59:59	$123	$121.209999084473	$122.019996643066	122.879997253418	0	$1,37,40,13,440	2013	122.104999542236
Bitcoin	BTC	22-05-2013 23:59:59	$124.000999450684	$122	$122.889999389648	123.888999938965	0	$1,38,57,78,992.85	2013	123.000499725342
Bitcoin	BTC	23-05-2013 23:59:59	$126.93399810791	$123.099998474121	$123.800003051758	126.699996948242	0	$1,41,77,69,832.5	2013	125.016998291016
Bitcoin	BTC	24-05-2013 23:59:59	$133.850006103516	$125.71900177002	$126.300003051758	133.199996948242	0	$1,49,10,70,770	2013	129.784503936768
Bitcoin	BTC	25-05-2013 23:59:59	$133.218994140625	$128.899993896484	$133.100006103516	131.979995727539	0	$1,47,79,58,233	2013	131.059494018555

3.3 Collections

The project involves collecting data from the Kaggle cryptocurrency dataset, which contains several key performance indicators such as price, volume, and market capitalization.

3.4 User Interface

- *The homepage dashboard shows an overview of cryptocurrency trends.*
- *Users can interact with charts to explore performance.*
- *Data can be filtered by cryptocurrency and date range.*
- *DAX functions are used to create extra columns like Year and Average.*

•

- **Software Environment:**

  o *Power BI Desktop for building the dashboard.*

  o *Kaggle cryptocurrency dataset in CSV format, which is imported into Power BI for analysis.*

Hardware Environment:

  o *Processor: Intel i3 or above.*

  o *RAM: Minimum 4 GB, though 8 GB is recommended for handling larger datasets smoothly.*

  o *Storage: At least 5 GB of free space for storing the project files and dataset.*

  o *Operating System: Windows 11 to ensure compatibility with Power BI.*

Data Flow Diagram:

.
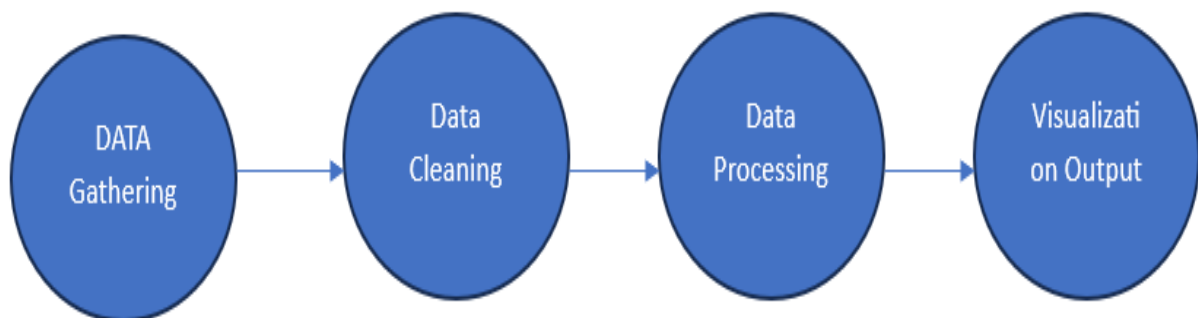
AAVE COIN	COSMOS COIN	IOTA COIN
BINANCE COIN	CRYPTO.COM COIN	LITE COIN
BITCOIN	DOGE COIN	MONOCOIN
CARDANO COIN	EOS COIN	NEM COIN
CHAINLINK COIN	ETHERIUM	POLKADOT COIN

SOLANA COIN	UNISWAP COIN
STELLAR COIN	USD COIN
TETHER COIN	WRAPPED BITCOIN
TRON COIN	XRP COIN

-

Used cards that indicates the summary of Data (Minimum, Maximum, Average , Marketcap and volume of currency)

Slicers is used for filtering the data with basis of particular year and particular currency .

In this Dashboard using slicers the line chart shows the market cap of Ethereum in 2017 with respect to Date .

-

In this Dashboard using slicers the line chart shows the High and Low market of Ethereum in 2017 with respect to Date .

In this Dashboard using slicers the line chart shows the Open and Close market of Ethereum in 2017 with respect to Date .

•

5. Drawbacks and Limitations

- *Static Data: Since the dataset is static and not linked to a live API, the dashboard does not provide real-time updates or live market information.*

- *Limited Cryptocurrency Scope: The dashboard is restricted to the cryptocurrencies and data available within the Kaggle dataset.*

- *Power BI Constraints: Power BI has limitations in terms of advanced customizations and interactivity compared to programming-based solutions like Python's Dash.*

6. Testing

The dashboard was tested to ensure accurate representation of cryptocurrency data and smooth user interaction:

- *Data Accuracy Testing: Cross-verified the dataset against reliable sources to ensure its accuracy.*

- *User Interface Testing: The dashboard's usability and interactivity were tested, ensuring smooth filtering and data navigation.*

- *Performance Testing: Tested the dashboard's ability to load and interact with large datasets without significant lag.*

7. Conclusion

This cryptocurrency dashboard demonstrates the power of data visualization in simplifying the analysis of complex financial datasets. By utilizing Power BI and a Kaggle dataset, the project delivers an interactive and user-friendly dashboard that allows users to analyze historical cryptocurrency trends and compare multiple cryptocurrencies. While the static nature of the data presents certain limitations, the dashboard provides a solid foundation for future enhancements, such as the integration of real-time data.

8. Bibliography

Microsoft Power BI Documentation. Retrieved from https://docs.microsoft.com/enus/power-bi/

Kaggle Cryptocurrency Dataset. Retrieved from https://www.kaggle.com/