Cryptocurrency Analysis

(COMP3125 Individual Project)

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Keywords—example1, example2, example3, example 4, example 5 (provide 3-5 keywords)

I. Introduction

Cryptocurrency has rapidly gained popularity and is increasingly being recognized as an alternative form of currency alongside traditional actual money. The growing interest in digital assets has led to significant market fluctuations and a dynamic trading environment. This project aims to analyze historical trends in cryptocurrency prices, identify the most volatile cryptocurrencies, and explore the relationship between global events and cryptocurrency prices. Additionally, the study will focus on predicting cryptocurrency prices based on historical data and technical indicators using machine learning models.

II. Datasets

A. *Price History Dataset:*

This dataset provides historical price movements of various cryptocurrencies, available at Kaggle.

B. *All Cryptocurrencies Dataset:*

This dataset includes a comprehensive list of cryptocurrencies and their attributes, available at Kaggle.

C. *Cryptocurrency Pairs Dataset*

This dataset offers minute-resolution data on cryptocurrency pairs, available at Kaggle.

III. Methodology

This study will address four key research questions:

A. *What are the historical trends of cryptocurrency prices?*

Time series analysis will be performed using visualization techniques such as line charts and moving averages to identify trends and patterns.

B. *Which cryptocurrencies have the most volatility?*

Standard deviation and coefficient of variation will be used to measure volatility. Clustering techniques like K-means may also be applied to classify cryptocurrencies based on their volatility characteristics.

C. *What is the correlation between cryptocurrency prices and global events or other financial indicators?*

Correlation matrices and regression models, such as Linear Regression and Random Forest Regression, will be employed to assess relationships between external factors and cryptocurrency price movements.

D. *Can we predict the price of a cryptocurrency based on historical data and technical indicators?*

A machine learning model, specifically a Long Short-Term Memory (LSTM) network, will be used for time series forecasting. Alternative models such as ARIMA and XGBoost will be considered depending on the dataset's characteristics and performance metrics.

By analyzing these aspects, this project aims to provide insights into cryptocurrency market behavior and the feasibility of predicting future price movements based on historical trends and external influences.

IV. Results

In this section, present your findings using an appropriate method, such as equations, numerical summaries, or visualizations like charts and graphs. Clearly explain all results and provide guidance on how to interpret them. If any unexpected results arise, discuss possible reasons or contributing factors. To improve clarity and organization, consider using subsections (e.g., A, B) to separate different aspects of your results.

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A. *Result A*

Example: XXX

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B. *Results B*

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C. Results C

a) Positioning Figures and Tables: Place figures and tables at the top and bottom of columns. Avoid placing them in the middle of columns. Large figures and tables may span across both columns. Figure captions should be below the figures; table heads should appear above the tables. Insert figures and tables after they are cited in the text. Use the abbreviation "Fig. 1", even at the beginning of a sentence.

TABLE I. TABLE TYPE STYLES

Table Head	Table Column Head		
	Table column subhead	***Subhead***	***Subhead***
copy	More table copy[a]		

[a] Sample of a Table footnote. (*Table footnote*)

Fig. 1. Example of a figure caption. (*figure caption*)

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V. DISCUSSION

Every method/project has its shortage or weakness. Please discuss the unsatisfied results in your project. And discuss the feasible suggestions of future work to revise/improve your result.

Example: xxx

VI. CONCLUSION

In this part, you should summarize your project. What important results did you find for your topic and what's the effect of this result on the real-world?

Example: xxx

ACKNOWLEDGMENT *(Heading 5)*

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[1] G. Eason, B. Noble, and I. N. Sneddon, "On certain integrals of Lipschitz-Hankel type involving products of Bessel functions," Phil. Trans. Roy. Soc. London, vol. A247, pp. 529–551, April 1955. *(references)*

[2] J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68–73.

[3] I. S. Jacobs and C. P. Bean, "Fine particles, thin films and exchange anisotropy," in Magnetism, vol. III, G. T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350.

[4] K. Elissa, "Title of paper if known," unpublished.

[5] R. Nicole, "Title of paper with only first word capitalized," J. Name Stand. Abbrev., in press.

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[7] M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.

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