National University
of computer and emerging sciences

AI PROJECT

Instruction:

- Late Submission is not allowed.
- In case of plagiarism, there will be negative marking.
- Complete all steps to get full more marks.

Question:

You are tasked with conducting an analysis of cryptocurrency prices from a popular finance website (which is assigned to your group). The goal is to scrape historical data, perform data manipulation using NumPy and Pandas, conduct various analyses, and present the results. Follow the steps below to accomplish this task:

Step 1: Scraping Data:

You need to scrape historical daily prices for three cryptocurrencies (Bitcoin, Ethereum, and Ripple) from a finance website (which is assigned to your group). Utilize the requests library to fetch the HTML content and BeautifulSoup for parsing.

Step 2: Data Cleaning and Structuring

Organize the scraped data into a structured format. Create a class, CryptoData, to represent each cryptocurrency's data. The class should include appropriate attributes and methods for data cleaning and structuring.

Step 3: Handling Missing Values

Deal with any missing values in the scraped data. Implement a strategy such as interpolation or filling with the mean.

Step 4: Data Transformation

Use NumPy to transform the price data into logarithmic returns for each cryptocurrency. Store the transformed data back in the respective CryptoData instances.

Step 5: Analysis

Perform the following analyses on the transformed data:

Calculate the mean, median, and standard deviation of the returns for each cryptocurrency.

Identify the date with the highest return for each cryptocurrency.

Determine the correlation matrix between the returns of Bitcoin, Ethereum, and Ripple.

Step 6: Visualization

Create visualizations for:

Line charts to show the historical prices of each cryptocurrency.

A bar chart to compare the mean returns of each cryptocurrency.

Step 7: Save Results

Save the cleaned and transformed data along with the analysis results in a CSV file for future reference.

Step 8: Summarize Findings

Provide a brief summary of your findings, including insights into the overall market trends and any notable events that might have influenced the cryptocurrency prices.

Step 9: OOP Concepts

Ensure your implementation adheres to OOP principles. Utilize encapsulation, inheritance, and polymorphism where appropriate within the CryptoData class.

Step 10: Documentation

Lastly, document your code thoroughly, including comments explaining the purpose of each method and any assumptions made during the analysis.