

AlgoRhythmic-X

ASSIGNMENT 0

May 7, 2024

Problem 1: Converting Hourly to Daily and Calculating Returns

1. Download Hourly Data:

- Use the yfinance library to download hourly data for an index (like S&P 500) and a stock for January 2023 to January 2024.

2. Convert Hourly Data to Daily Data:

- Write a function that converts hourly data into daily data. Apply this function to both the index and stock data.

3. Calculate Daily and Cumulative Returns:

- Write a function to calculate daily returns (percentage change) from daily closing prices.
- Calculate daily returns for both the index and stock, then compute cumulative returns.
- Plot daily and cumulative returns for both the index and stock on a single chart to compare their performance.

Problem 2: Datetime Operations and Rolling Means

1. Download Daily Data or Convert Hourly Data to Daily:

- Use yfinance to download daily stock data for any ticker from January 2023 to January 2024, or use the function from Problem 1 to convert hourly data into daily data.

2. Calculate a New Datetime Attribute:

- Extract the day of the week from the Date column and add it as a new column in the DataFrame.
- Determine which day of the week has the highest average closing price and plot the results.

3. Calculate the 7-Day Rolling Mean:

- Write a function that adds a 7-day rolling mean column for a specified DataFrame column.
- Apply this function to add the 7-day rolling mean for the Close column.

Use of ChatGPT and any sort of plagiarism will be strictly dealt with.
Deadline for the submission is 12th May EOD (Sunday).