Assignment 1 – InvestoQuest

Deadline: 23rd May

Objective

This assignment aims to familiarize you with basic data analysis techniques for portfolio management and guide you through calculating portfolio weights for multiple assets.

What You Have

- A **zip file** containing daily OHLCV (Open, High, Low, Close, Volume) data for **10 stocks** over the past several months.

Your Tasks

1. Data Preparation

- Load the data for all 10 stocks.
- Create a **single DataFrame** with 10 columns representing the **closing prices** of each stock, indexed by date.
- Ensure the dates align correctly and handle any missing data appropriately.

2. Data Analysis and Weight Assignment

- Define **parameters/metrics** based on the OHLCV data that reflect the attractiveness or riskiness of each stock. Examples include:
  - Volatility (standard deviation of returns)
  - Momentum (moving average returns)
  - Average volume (liquidity)
- Using your chosen parameters and logical conditions, **assign weights** to each of the 10 stocks.
- **Normalize** these weights so they sum to 1 (complete allocation of capital). Stocks can have fractional weights.

3. Portfolio Management Assumptions

- When you change weights, assume **full withdrawal from all stocks** and **reallocation** according to new weights.
- A **transaction fee of 0.1%** applies on the value withdrawn from each stock during reallocation.
- Assume you start with an initial capital of your choice (e.g., 100,000 units).

4. Portfolio Tracking and Visualization

- Track the **daily portfolio value** over the entire period based on your weight allocations and price movements.
- Identify the **top 3 performing stocks** in the dataset (by buy-and-hold return).
- Plot a graph showing:
  - Your **portfolio value** over time
  - The **closing price trends** of the top 3 stocks (either on the same or separate plots for clarity)

Deliverables

- Your **code (Jupyter Notebook or Python script)** performing the above tasks.
- A **short report or markdown section** explaining:
  - The parameters you chose for assigning weights and why
  - How you normalized weights and handled transaction fees
  - Insights from your portfolio performance and the top 3 stocks
- Graphs as described above.

Hints

- Use pandas and numpy for data handling. You can also use matplotlib or seaborn for plotting.
- Calculate daily returns to compute momentum and volatility.
- Normalize weights by dividing each weight by the sum of all weights.
- Consider using a rolling window (e.g., 20 days) to calculate moving averages or volatility.

BONUS

Instead of using the given example metrics (volatility, momentum, volume), try to **invent a unique method or metric** to distribute the weights. Be creative and justify your

new approach clearly in your report.