**DSCI-560: Lab 4 Report**

**Course:** Data Science Practicum  
**Team Members:** Jaival Upadhyay, Pratham Solanki, Mayank Patil  
**Team Name :** Guardians of the algorithm(Group 6)

**1) Algorithm Development**

**2) Mock Trading Environment**

The mock trading environment simulates stock trading using historical price data from processed\_stock\_data.csv. Users start with a fixed initial capital, evenly distributed across selected stocks.

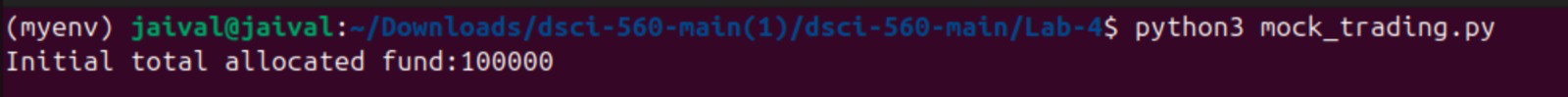
**Trading Strategy**

The trading strategy is based on a simple moving average (SMA) crossover method to decide when to buy and sell stocks. It tracks two averages: a 5-day SMA (short-term trend) and a 20-day SMA (long-term trend). When the 5-day SMA moves above the 20-day SMA, it signals that prices are rising, so the system buys the stock. When the 5-day SMA drops below the 20-day SMA, it suggests prices may fall, so the system sells. The goal is to buy when an uptrend starts and sell before a downtrend, aiming to maximize gains while minimizing losses.

**Code explanation**

The code simulates a mock trading system using a moving average crossover strategy to analyze stock trends and execute trades. It loads historical stock price data from processed\_stock\_data.csv, initializes an investment amount, and distributes capital across selected stocks. The strategy calculates 5-day and 20-day SMAs, generating buy signals when the short-term SMA crosses above the long-term SMA and sell signals when it drops below. The system executes trades, updates cash balance, portfolio value, and holdings, and logs transactions. To evaluate performance, it computes total return, annualized return, and Sharpe ratio, along with a portfolio value visualization. The results help assess the effectiveness of the trading strategy.

**Output:**

****

**A screenshot of a computer

Description automatically generated**

**A graph on a white background

Description automatically generated**

**A graph on a white background

Description automatically generated**

**A computer screen with white text

Description automatically generated**

* Transaction Logs – “transaction\_log.csv”:

A table with numbers and letters

Description automatically generated

**3) Team Discussions**

To ensure smooth collaboration, the team met daily to discuss the assignment progress and next steps. The Minutes of Meeting (MoM) document is attached separately, detailing our discussions from Wednesday to Saturday.

**4) Details**

The following files have been submitted as part of Lab 4:

* All code files for the working solution.
* Report\_readme documen explaining how to run the code.
* Minutes of Meeting documenting team discussions.
* GitHub history details for version tracking.

**5) Conclusion**

This lab provided hands-on experience in real-time stock price analysis and algorithmic trading. We successfully implemented and tested a trading algorithm in a simulated environment, evaluated its performance, and participated in a team competition.

**6) Github History**