STOCK PORTFOLIO MANAGEMENT SYSTEM

Trang Tran

ALY6140 - Final Project

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PROJECT OBJECTIVE

The objective is to create a stock portfolio management system that allows users to manage their investments effectively. The system will provide the following features:

***Portfolio Management:** Users can add stocks, update, or remove them from their portfolio, including information like stock symbol plus company name, purchase date, purchase price, and quantity. Users can make separate portfolios.

***Real-Time Stock Prices:** The system will retrieve real-time stock prices using financial APIs (e.g., Alpha Vantage or Yahoo Finance). Hence, users can view the current value of their portfolio based on the latest stock prices.

***Performance Metrics:** The system will calculate key portfolio performance metrics, including total portfolio value, total gain/loss, percentage gain/loss, etc.

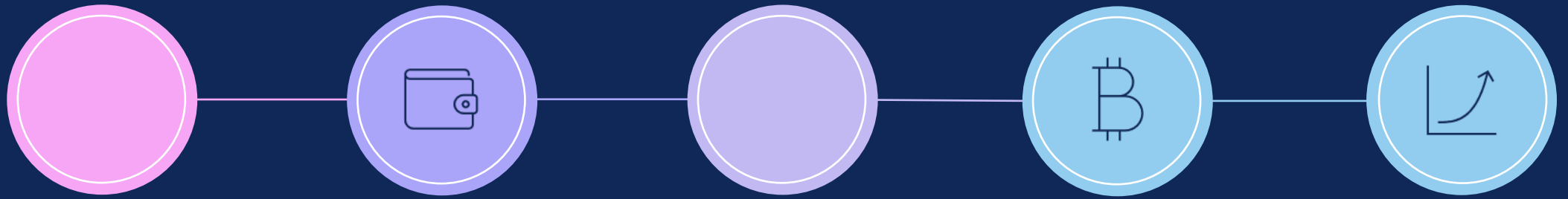
***Visualization:** Users can visualize their portfolio's performance and check historical performance trends using interactive charts.

DATA SOURCE

For real-time stock prices and historical data, the system will utilize financial APIs (e.g., Alpha Vantage or Yahoo Finance) to fetch stock information. We'll rely on live data from these APIs. Other data will be users' input.

*Yahoo Finance API: use the "yfinance" package in Python

PROJECT BUILDUP



Step 1

Build “Stock” and “Portfolio” objects

Step 2

Define all attributes and methods within each class

Step 3

Write the main functioning and programming

Step 4

Test the program and add user input

Step 5

Interact with real-time stock data and all functions

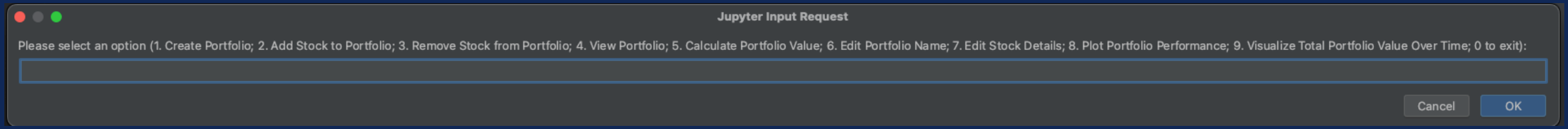
CODE SAMPLES

```python
class Stock:
    def __init__(self, symbol, company_name, purchase_date, purchase_price, quantity):
        self.symbol = symbol
        self.company_name = company_name
        self.purchase_date = purchase_date
        self.purchase_price = purchase_price
        self.quantity = quantity

class Portfolio:
    def __init__(self, name):
        self.name = name
        self.stocks = []

    def add_stock(self, stock):
        # Ensure consistent date formatting
        try:
            stock.purchase_date = datetime.strptime(stock.purchase_date, '%Y-%m-%d').date()
        except ValueError:
            print("Invalid date format. Please use 'YYYY-MM-DD' format.")
            return

        self.stocks.append(stock)

    def remove_stock(self, symbol):
        self.stocks = [s for s in self.stocks if s.symbol != symbol]

    def get_current_stock_price(self, symbol):
```

```python
def visualize_portfolio_performance_over_time(self, time_scale):
    # Define time intervals (1w, 1mo, 1y)
    if time_scale == '1w':
        period = '1wk'
    elif time_scale == '1mo':
        period = '1mo'
    elif time_scale == '1y':
        period = '1y'
    else:
        raise ValueError("Invalid time scale")

    fig, ax = plt.subplots(figsize=(10, 6))

    for stock in self.stocks:
        # Fetch historical data for the selected time period
        historical_data = yf.Ticker(stock.symbol).history(period=period)

        # Calculate performance metrics (e.g., current value, purchase value, gain/loss)
        dates = historical_data.index
        closing_prices = historical_data['Close']
        current_value = closing_prices * stock.quantity
        purchase_value = stock.purchase_price * stock.quantity
        gain_loss = current_value - purchase_value

        # Plot performance data for the stock
        ax.plot(dates, current_value, label=f'{stock.symbol} - Current Value')
```

RESULT SAMPLES

```
Welcome to Stock Portfolio Management System! Please select an option below:
1. Create Portfolio
2. Add Stock to Portfolio
3. Remove Stock from Portfolio
4. View Portfolio
5. Calculate Portfolio Value
6. Edit Portfolio Name
7. Edit Stock Details
8. Plot Portfolio Performance
9. Visualize Total Portfolio Value Over Time
0. Exit
```



RESULT SAMPLES

```
Option 4 selected.
Portfolio Name: abc
Stocks in Portfolio:

Stock Symbol: NVDA
Company Name: Nvidia
Purchase Date: 2023-09-09
Purchase Price: $370.00
Current Price:  429.75
Quantity: 100

Stock Symbol: AAPL
Company Name: Apple
Purchase Date: 2023-09-28
Purchase Price: $160.00
Current Price:  173.00
Quantity: 200

Total Purchase Value: 69000.0
Total Current Value: $77575.00
Total Gain/Loss: $8575.00
Percentage Gain/Loss: 12.43%
```

```
Option 5 selected.
Total current value of 'abc' portfolio: $77575.00
Total purchase value of 'abc' portfolio: $69000.00
Total gain/loss of 'abc' portfolio: $8575.00
Total percentage gain/loss of 'abc' portfolio: $12.43%

Welcome to Stock Portfolio Management System! Please select an option below:
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4. View Portfolio
5. Calculate Portfolio Value
6. Edit Portfolio Name
7. Edit Stock Details
8. Plot Portfolio Performance
9. Visualize Total Portfolio Value Over Time
0. Exit
Option 0 selected.
Exiting the management program. Thank you!
```
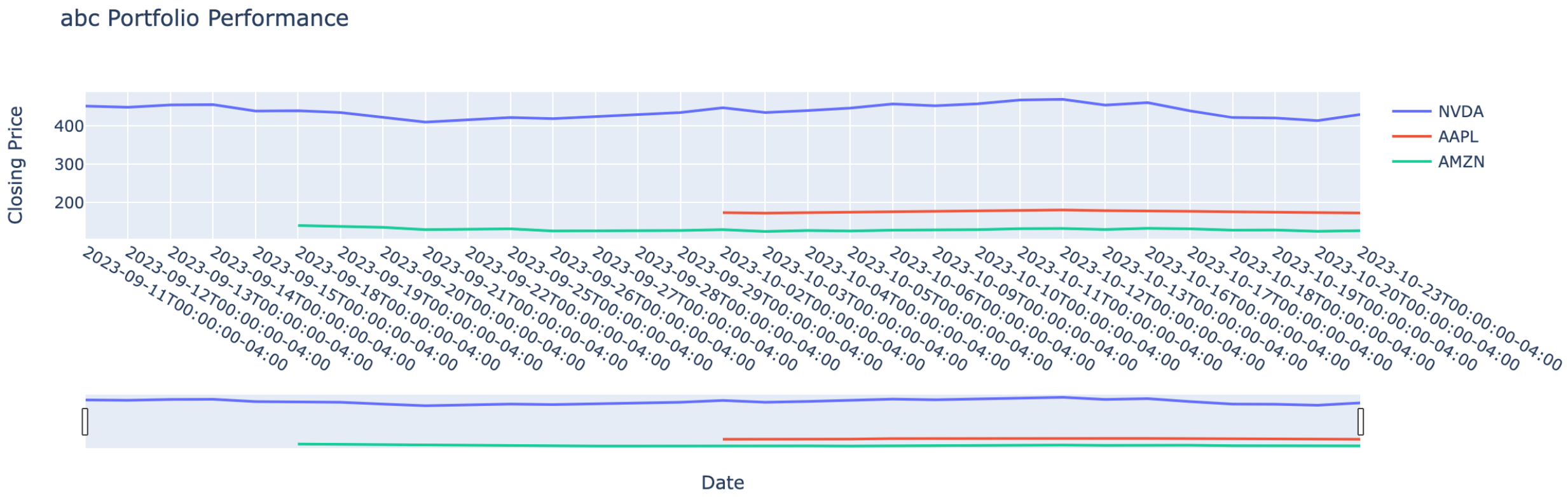
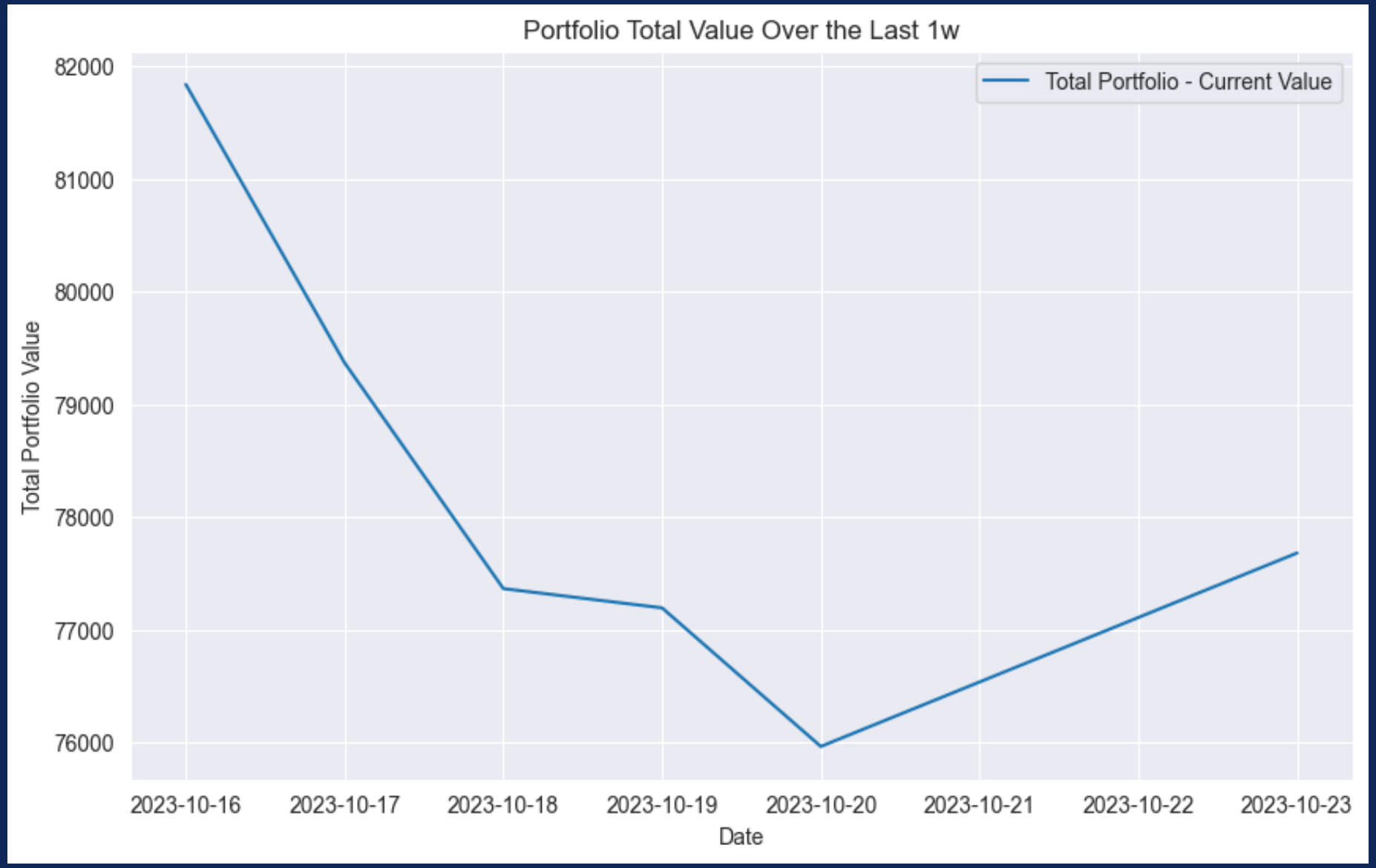

RESULT SAMPLES



RESULT SAMPLES



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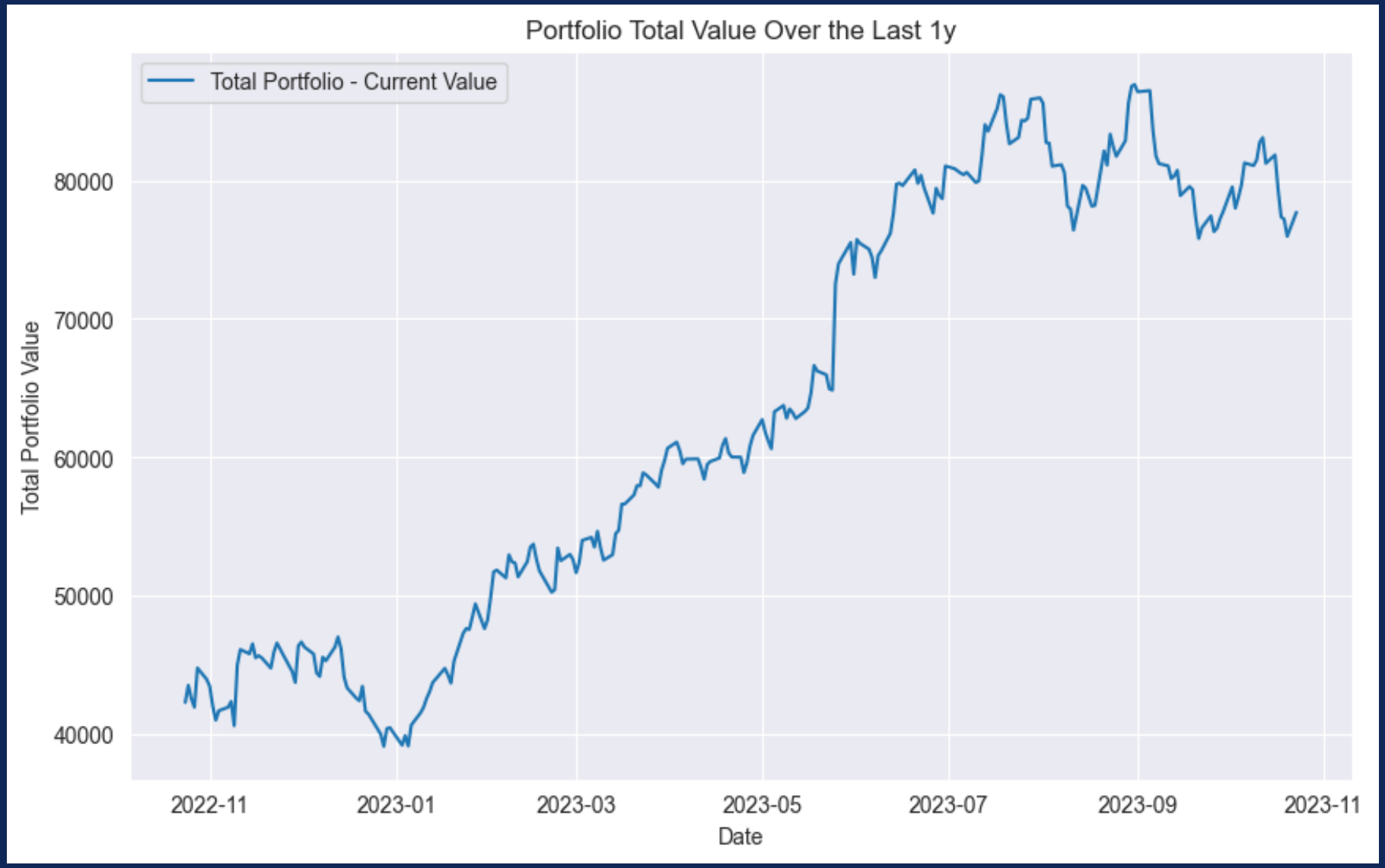

THANK YOU

Program Demo Session Now!