CIS 501: Software Architecture and Design

Programming Assignment 1, Fall 2017
Individual Work

Due on September 7, 2016 11:59 PM US Central Time.

Introduction
"*A portfolio is a combination of different investment assets mixed and matched for achieving an investor's goal(s)*": **Investopedia**.

The goal of this programming assignment is to implement a portfolio that will contain only stocks as investment instruments. We will call this application **Ticker501**. Our Ticker501 will help us keep track of the stocks we own and provide some basic financial information. Ticker501 includes an "Account" that contains the amount in US dollars that (a) we can use immediately to buy stocks or withdraw -cash-, and (b) the total value of our portfolio, that is, cash plus value of stocks at that moment.

Some of the functionality Ticker501 will provide is specified below.

- Account funds
    - Add funds to your portfolio account, in dollar amounts.
    - Withdraw money from your portfolio account.
        - The amount to withdraw should not be greater than the cash balance in your account plus the dollar amount from selling all your stock positions at the moment of the transaction minus all commissions and fees
        - If the requested amount to withdraw is greater than the cash amount in the account balance, you need to notify the user and ask what positions he/she would like to sell in order to fulfill the withdraw transaction.
    - A **flat-fee per trade** (buy or sell) is $9.99. Let's say, for example, that you want to buy 100 shares of ABC for $10. Your total cost will be $1009.99.
    - A **flat-fee per transfer** (deposits or withdraws) is $4.99
        - **deposit** is defined as money transferred from your checking account into your Ticker501 account
        - **withdraw** is defined as money transferred from you Ticker501 account into your bank account
- Account Balance

    Ticker501 will give the user options to see:
    - Cash and Positions balance in dollar amount and percentage of the total account.

- o Positions Balance. The percentage of each stock in the account. The amount in dollars of each stock in the account. (The amount in dollars equivalent to selling all the stocks at the moment of report).
- o Gain/Losses Report in dollar amounts based on:
  - ▪ Period (Start/end date)
- Create a Portfolio
  - o User can create and track up to three portfolios
  - o Each portfolio has its own name/identifier
- Delete a Portfolio
  - o A user can delete a portfolio and by doing so, all positions in that portfolio are sold in a single transaction and the gains/losses reflected in the account cash balance.
- Portfolio Balance (Single Portfolio)
  - o Portfolio-Balance. The amount in dollars and percentage of the total portfolio. (e.g. $4,567 35% of Account Investments - not including cash)
  - o Stock- Balance. The percentage of each stock in this portfolio, and the amount in dollars of each stock in the portfolio. (The amount in dollars equivalent to selling all the stocks at the moment of report).
  - o Gain/Losses Report in dollar amounts based on:
    - ▪ Period (Start/end date)
- Buy a stock
  - o Enter the ticker
    - ▪ Ticker501 will seek in the DB (file) the current price for the ticker entered. When testing, only tickers in the DB will be entered
  - o Option 1. Enter number of stocks to purchase
    - ▪ Only integer numbers, no decimals
  - o Option 2. Enter amount in dollars to purchase stock represented by ticker
    - ▪ Ticker501 does not allow the purchase of fractions of a stock, only whole stocks

Assignment Requirements

Task
You are to work on your own, this is NOT a team assignment.
In this first programming assignment, you are to develop a simple Ticker501 **console** app. Since this is a console app, it is number-letter-menu-based not GUI-based.

Elaboration
Your tasks for this assignment are to:

1. Implement the above Ticker501 console app.

   Important: You must put comments at each class and method, even a group of statements to help us understand your implementation.

2. Along with the Ticker501 console app implemented to provide the functionality described above, you need to implement a small simulator that simulates the variation in the stock price. The simulator will give the user the following options:

   1) Update stock prices. This process will read the current price for each ticker in the file and randomly increment or decrement the stock price. The amount to increment/decrement the stock price will be calculated based on the volatility of the market specified as:
   - high-volatility- Increment/decrement the price from 3%-15%
   - medium-volatility- - Increment/decrement the price from 2%-8%
   - low-volatility- Increment/decrement the price from 1%-4%

   You will randomly decide if you will increment or decrement the price, them, you will calculate the percentage to be incremented or decremented within the range depending of **the market volatility, which will be entered by the user in the simulator**.

Submission

To submit, create a solution in VS, push your initial solution to GitHub, work in your assignment committing and pushing your progress regularly, when finish, commit and push your solution to GitHub by the deadline.

**No email submission will be accepted for this assignment. **

Portfolio Balance (Single Portfolio)
  o Cash and Positions balance in dollar amount and percentage of the total portfolio. (See C-01)
  o Positions Balance. The percentage of each stock in this portfolio. The amount in dollars of each stock in the portfolio. (The amount in dollars equivalent to selling all the stocks at the moment of report). (See C-02)
  o Gain/Losses Report in dollar amounts based on: § Period (Start/end date) (See C-03)

C-01 This should read: "Positions balance in dollar amount and percentage of the total portfolio". I removed the "Cash" because it does not make sense, the only place you should see the cash available is at the account level. In the example below the Teck portfolio is 45% of the total account investment, and it has a dollar value of $55,368.

Teach Portfolio
  Total investment: $ 55,386
  Percentage of Account: 45%

C-02.. Each portfolio contains stocks. So, for example if I have in my portfolio "Tech" 50 Apple stocks, 50 Google stocks, 50 CISCO stocks, and 50 Facebook stocks, Ticker501 should tell me that "Tech" portfolio is:

$ 6,437.50   - (25%) AAPL Apple Inc.
$40,762.00   - (25%) GOOGL Google
$ 1,525.00   - (25%) CSCO Cisco Systems, Inc.
$ 6,661.50   - (25%) FB Facebook Inc.

C-03. Ticker501 keeps track of my gain/losses from the time I created the account. If I funded my account with $50K at the beginning, and at the time of the report the available cash + the dollar amount of selling all my holdings (stocks) is $58,345, then Ticker501 should display the amount of $8,345 as gains.

Account Funds Functionality	5
Account Balance Functionality	10
Portfolio Balance Functionality	10
Buy and Sell Stocks Functionality	5
Create and Delete Portfolios Functionality	5
Error Handling and Feedback	5
User Friendly	5
Code Documentation	5
Total	50