

CSE141 Introduction to Programming (Fall'23) Homework #1



Max Marks: 0 Due: Oct 1 by 11:55pm

Stock Market

In this homework, we write C++ programs to predict the performance of various stocks.

Part 0: read in the data

The following program reads in a sequence of stock prices and prints them out.

```
#include<iostream>
#include<iomanip>

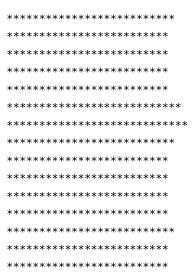
int main() {
    std::cout << std::fixed << std::setprecision(3);
    // set precision to 3 decimal places

    double price;
    while(std::cin >> price) {
        std::cout << std::setw(10) << price << "\n";
        // setw() sets the width of the next output value
    }
    return 0;
}</pre>
```

Type the program exactly as is; save as input.cpp; and compile with "g++ input.cpp". To read in the data from a file named stock15.txt, type "a < stock15.txt" in your terminal (cmd on Windows). You can also test your program on stock1000.txt, a larger file that contains real data.

Part 1: plot

Write a program plot.cpp to display the stock values graphically instead of just printing the values. Round the stock price down to the nearest integer, and print that number of *'s. The correct output is:



Part 2: detect a pattern

Write a program to identify specific trends in the data. Dilbert the Day Trader believes that if the stock goes up 3 (or more) consecutive time periods and then down in the next period, then it is a good time to sell the stock. Analogously, Dilbert believes that if the stock goes down 3 consecutive time periods and then up in the next period, then it is a good time to buy the stock. Write a program pattern.cpp that prints out the time period and stock price, along with the word buy or sell according to Dilbert's rule. The output should look like this:

1	26.375	
2	25.500	
3	25.125	
4	25.000	
5	25.250	buy
6	27.125	
7	28.250	
8	26.000	sell
9	25.500	
10	25.000	
11	25.125	buy
12	25.250	
13	26.375	
14	25.500	sell
15	25.500	

Part 3: invest

Write a program <code>invest.cpp</code> to determine how much money you would have won or lost using Dilbert's rule. You start with PKR 10,000.00 cash. Assume that you will convert all of your cash to stock when Dilbert's rule signals you to buy, and that you will convert all of your stock to cash when Dilbert's rule signals you to sell. For each time period, print out the price, cash, shares owned, and portfolio value. The value of your portfolio is cash plus the number of shares multiplied by the price per share. (For simplicity, assume that you can buy fractional amounts of stock, and there are no transaction fees.) For <code>stock15.txt</code>, the correct output is:

period	price	cash	shares	value
1	26 275	10000 00	0.00	10000 00
1	26.375	10000.00	0.00	10000.00
2	25.500	10000.00	0.00	10000.00
3	25.125	10000.00	0.00	10000.00
4	25.000	10000.00	0.00	10000.00
5	25.250	0.00	396.04	10000.00
6	27.125	0.00	396.04	10742.57
7	28.250	0.00	396.04	11188.12
8	26.000	10297.03	0.00	10297.03
9	25.500	10297.03	0.00	10297.03
10	25.000	10297.03	0.00	10297.03
11	25.125	0.00	409.83	10297.03
12	25.250	0.00	409.83	10348.26
13	26.375	0.00	409.83	10809.32
14	25.500	10450.72	0.00	10450.72
15	25.500	10450.72	0.00	10450.72

Submission

Submission instruction will be announced later.

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