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;
}
```

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:

```
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```

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 `invest.cpp` 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 `stock15.txt`, the correct output is:

```
period   price     cash       shares    value
-----------------------------------------------
   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.