

Maximum Stock Return

Filename: stock

In your Economics class, you calculated the profit of buying and selling a stock once, over the course of a semester. However, real day traders tend to make more than one trade every season. In fact, as the term suggests, they make trades every day!!! In this problem, you want to build a better model that might earn you more money than making just one trade. To keep things simple however, at any given point in time, you're only allowed to own one stock out of two possible stocks. (You may also keep all of your money out of the market for a particular day.) If you own a particular stock, you will buy as many shares of that stock as possible.

In this problem you'll be given the daily stock history of two stocks, the initial amount of money you have to invest, as well as the cost of a transaction, known as a transaction fee. A transaction is the buying or selling of any quantity of shares of a stock.

As an example, consider the following three day data of Google stock and Apple stock:

Google: 759.68, 765.74, 770.17

Apple: 443.00, 457.82, 457.04

Imagine that we started with \$10,000 and the transaction fee was \$50. On day one, we buy Apple stock. The maximum we can buy is 22 shares, which costs us $22 \times \$443 + \$50 = \$9796$. Thus we have \$204 cash leftover. In one day, our 22 shares we own are worth $22 \times \$457.82 = \10072.04 . Thus our current value, if we choose to cash out would be $\$10072.04 - \$50 + \$204 = \10226.04 . If we then turn around at the end of that day and buy Google stock, we can get 13 shares for $13 \times \$765.74 + \$50 = \$10004.62$, leaving us with \$221.42 in cash. At the end of the last day, the value of our Google stock is $13 \times \$770.17 = \10012.21 . At the end of our trading period (three days in this example) we are forced to sell the stock and our total value at the end of the three days for these set of actions is $\$221.42$ (old cash) + $\$10012.21$ (selling stock) - $\$50$ (selling fee) = $\$10183.63$. Alternatively, we could have simply chosen to not buy any stock on day three. In this scenario, we simply keep the $\$10226.04$ that we had right after selling the Apple stock. (For this scenario, this is the optimal outcome.)

The Problem:

Based on this the daily stock history of two stocks for a fixed trading period, the initial amount of money you have to invest and the transaction fee, you need to calculate the maximum money you can have at the end of the last day of the trading period given, assuming that you cash out at the end of that day.

The Input:

The first line of the input file has a single positive integer, n ($n \leq 50$), representing the number of stock scenarios to evaluate. The first line of each stock scenario has the number of days for that scenario, d ($1 < d \leq 15$), followed by a space, then a positive real number given to two decimal places, T ($T \leq 100.00$), representing the transaction fee for the scenario, followed by a space and a positive real number given to two decimal places, M ($M < 10000000$), representing the amount of money available to invest at the beginning of the stock scenario in dollars. The second line of

each stock scenario will contain d positive real numbers given to two decimal places separated by spaces representing the value of stock #1 on days 1 through d , respectively. The third line of each stock scenario will contain d positive real numbers given to two decimal places separated by spaces representing the value of stock #2 on days 1 through d , respectively. All of the costs for each stock per share will be less than 1000.00 (in dollars).

The Output:

For each stock scenario, output a single line with the maximum value in dollars to decimal places that can be obtained by trading under the given restrictions of the problem.

Sample Input:

```
2
3 50.00 10000.00
759.68 765.74 770.17
443.00 457.82 457.04
2 5.99 29999.99
59.99 58.99
22.67 20.73
```

Sample Output:

```
10226.04
29999.99
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