Level: Easy

Competition: CSI KJSCE’s Code in X 2017-18

Question:

The Data Engineers of a Share Broker were able to develop a very accurate share price prediction system. It provided a list of n predictions of costs of a particular share for next n consecutive days. The next step was to automate the buying and selling procedures and predict which share could result in maximum profit. The challenge is to devise an algorithm to find the maximum profit that can be obtained by buying, selling or performing no transaction on a given share. The number of days and predicted prices will be fed as input. Assume that the share is not bought initially and is always sold by the last days.

Input:

N=Number of days (integral)

Costs on each day (real numbers with maximum accuracy up to 4 decimal places)

Output:

Maximum attainable profit for the given share over the next n days (up to 4 decimal places)

Example:

11

Day: 1 2 3 4 5 6 7 8 9 10 11

Price: 1 2 4 3 5 2 8 9 1 2 8

Action: B - S B S B - S B - S

B: Buy

S: Sell

Max Profit: 19

Test your algorithm against these cases:

|  |  |
| --- | --- |
| **Inputs** | **Outputs** |
| 10  1 2 3 4 5 6 7 8 9 10 | 9 |
| 10  10 9 8 7 6 5 4 3 2 1 | 0 |
| 12  1 2 4 3 5 2 8 9 1 2 4 8 | 19 |
| 10  1 2 3 4 3 1 5 4 3 1 | 7 |
| 5  1 1 1 1 1 | 0 |
| 15  1 2 2 3 4 5 5 4 3 2 2 0 0 10 10 | 14 |

Was that too easy??? Try this:

Find the maximum loss that maybe incurred for the same share without repeating the process.

**Obviously, use the previous answer and some thinking to do this without loops or recursions.**

Example:

11

Day: 1 2 3 4 5 6 7 8 9 10 11

Price: 1 2 4 3 5 2 8 9 1 2 8

Action: - - B S B S - B S - -

B: Buy

S: Sell

Max Loss: 12