Simple Max Difference

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Recommended Time: 19 mins Points: 50 9 test cases (4 samples)

Skills: Problem Solving (Basic)

Coding EASY Implementation Arrays Problem Solving Theme: Finance Interviewer Guidelines

In securities research, an analyst will look at a number of attributes for a stock. One analyst would like to keep a record of the highest positive spread between a closing price and the closing price on any prior day in history. Determine the maximum positive spread for a stock given its price history. If the stock remains flat or declines for the full period, return -1.

Example 0

px = [7, 1, 2, 5]

Calculate the positive difference between each price and its predecessors:

- At the first quote, there is no earlier quote to compare to.
- At the second quote, there was no earlier price that was lower.
- At the third quote, the price is higher than the second quote:
  - 2 - 1 = 1
- For the fourth quote, the price is higher than the third and the second quotes:
  - 5 - 2 = 3
  - 5 - 1 = 4.
- The maximum difference is 4.

Example 1

px = [7, 5, 3, 1]

- The price declines each quote, so there is never a difference greater than 0. In this case, return -1.

Function Description

Complete the function *maxDifference* in the editor below.

maxDifference has the following parameters:

int px[n]: an array of stock prices (quotes)

Returns:

int: the maximum difference between two prices as described above

Constraints

- $1 \leq n \leq 10^5$
- $-10^5 \leq px[i] \leq 10^5$

▼ Input Format For Custom Testing

Locked stub code reads input from stdin and passes it to the function.

The first line contains an integer, *n*, denoting the number of elements in the array *px.*

Each of the next *n* lines contains an integer, *px[i].*

▼ Sample Case 0

Sample Input For Custom Testing

```
STDIN    Function
-----    --------
7    →   px[] size n = 7
2    →   px = [2, 3, 10, 2, 4, 8, 1]
3
10
2
4
8
1
```

Sample Output

```
8
```

Explanation

Calculate the positive difference between each price quote and the previous ones :

- There is no predecessor for the first quote.
- At the second quote, the price is higher than the first quote:
  - *px[1] - px[0] = 3 - 2 = 1*
- At the third quote, the price is higher than the first and second quotes:
  - *px[2] - px[1] = 10 - 3 = 7*
  - *px[2] - px[0] = 10 - 2 = 8*
- At the fifth quote, the price is higher than the first and second quotes:
  - *px[4] - px[1] = 4 - 3 = 1*
  - *px[4] - px[0] = 4 - 2 = 2*
- At the sixth quote, the price is higher than the first, second, fourth and fifth quotes:
  - *px[5] - px[0] = 8 - 2=6*
  - *px[5] - px[1] = 8 - 3=5*
  - *px[5] - px[3] = 8 - 2=6*
  - *px[5] - px[4] = 8 - 4=4*
- The maximum difference is 8.

▼ Sample Case 1

Sample Input For Custom Testing

```
STDIN    Function
-----    --------
6    →   px[] size n = 6
7    →   px = [7, 9, 5, 6, 3, 2]
9
5
6
3
2
```

Sample Output

```
2
```

Explanation

Calculate the positive difference between each quote and the previous ones :

- The second quote, the price is higher than the first:
    - *px[1] - px[0] = 9 - 7 = 2*
- After that, the prices decline steadily.
- The maximum difference is 2.