Sherlock and Cost

HackerRank

In this challenge, you will be given an array B and must determine an array A. There is a special rule: For all i, $A[i] \leq B[i]$. That is, $A[i]$ can be any number you choose such that $1 \leq A[i] \leq B[i]$. Your task is to select a series of $A[i]$ given $B[i]$ such that the sum of the absolute difference of consecutive pairs of A is maximized. This will be the array's *cost*, and will be represented by the variable S below.

The equation can be written:

$$S = \sum_{i=2}^{N} |A[i] - A[i-1]|$$

For example, if the array $B = [1, 2, 3]$, we know that $1 \leq A[1] \leq 1$, $1 \leq A[2] \leq 2$, and $1 \leq A[3] \leq 3$. Arrays meeting those guidelines are:

```
[1,1,1], [1,1,2], [1,1,3]
[1,2,1], [1,2,2], [1,2,3]
```

Our calculations for the arrays are as follows:

```
|1-1| + |1-1| = 0        |1-1| + |2-1| = 1        |1-1| + |3-1| = 2
|2-1| + |1-2| = 2        |2-1| + |2-2| = 1        |2-1| + |3-2| = 2
```

The maximum value obtained is 2.

Function Description

Complete the *cost* function in the editor below. It should return the maximum value that can be obtained.

cost has the following parameter(s):

- *B*: an array of integers

Input Format

The first line contains the integer t, the number of test cases.

Each of the next t pairs of lines is a test case where:
- The first line contains an integer n, the length of B
- The next line contains n space-separated integers $B[i]$

Constraints

- $1 \leq t \leq 20$
- $1 < n \leq 10^5$
- $1 \leq B[i] \leq 100$

Output Format

For each test case, print the maximum sum on a separate line.

Sample Input

```
1
5
10 1 10 1 10
```

Sample Output

```
36
```

Explanation

The maximum sum occurs when A[1]=A[3]=A[5]=10 and A[2]=A[4]=1. That is
$|1-10|+|10-1|+|1-10|+|10-1|=36$.