code jam

cout << "hello, world!" << endl;

Practice Mode

Submissions

Fairland	
3pt	Not attempted **319/328 users** correct (97%)
9pt	Not attempted **212/291 users** correct (73%)
Smoothing Window	
6pt	Not attempted **194/268 users** correct (72%)
7pt	Not attempted **184/194 users** correct (95%)
Runaway Quail	
8pt	Not attempted **45/107 users** correct (42%)
15pt	Not attempted **16/20 users** correct (80%)
Log Set	
6pt	Not attempted **197/212 users** correct (93%)
19pt	Not attempted **55/109 users** correct (50%)
River Flow	
10pt	Not attempted **15/43 users** correct (35%)
17pt	Not attempted **11/11 users** correct (100%)

Top Scores

rng..58	73
tkociumaka	73
Gennady.Korotkevich	73
Xhark	73
linguo	72
iwi	68
tczajka	64
simonlindholm	60
kevinsogo	60
vepifanov	58

Problem B. Smoothing Window

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the Quick-Start Guide to get started.

Small input 6 points	Solve B-small
Large input 7 points	Solve B-large

Problem

Adamma is a climate scientist interested in temperature. Every minute, she records the current temperature as an integer, creating a long list of integers: $x_1, x_2, \ldots, x_{\mathbf{N}}$. (Adamma uses her own special temperature scale rather than a familiar one like Celsius or Kelvin, so it's possible for the values to be large and negative!) She often plots these temperatures on her computer screen.

This morning, she decided to compute a sliding average of this list in order to get a smoother plot. She used a smoothing window of size **K**, which means that she converted the sequence of **N** temperatures into a sequence of (**N** - **K** + 1) average temperatures: $s_1, s_2, \ldots, s_{\mathbf{N}-\mathbf{K}+1}$. Each s_i is the average of the values $x_i, x_{i+1}, \ldots, x_{i+\mathbf{K}-1}$. The original x_i values were all integers, but some of the s_i may be fractional.

Unfortunately, Adamma forgot to save the original sequence of temperatures! And now she wants to answer a different question -- what was the difference between the largest temperature and the smallest temperature? In other words, she needs to compute $\max\{x_1, \ldots, x_{\mathbf{N}}\} - \min\{x_1, \ldots, x_{\mathbf{N}}\}$. But she only has **N**, **K**, and the smoothed sequence.

After some thinking, Adamma has realized that this might be impossible because there may be several valid answers. In that case, she wants to know the smallest possible answer among all of the possible original sequences that could have produced her smoothed sequence with the given values of **N** and **K**.

Input

The first line of the input gives the number of test cases, **T**. **T** test cases follow; each test case consists of two lines. The first line contains integers **N** and **K** separated by a space character. The second line contains integer values $\text{sum}_1, \text{sum}_2, \ldots, \text{sum}_{\mathbf{N}-\mathbf{K}+1}$, separated by space characters. s_i is given by $\text{sum}_i / \mathbf{K}$.

Output

For each test case, output one line containing "Case #x: y", where x is the test case number (starting from 1) and y is the smallest possible difference between the largest and smallest temperature.

Limits

$1 \le \mathbf{T} \le 100$.
$2 \le \mathbf{K} \le \mathbf{N}$.
The sum_i will be integers between -10000 and 10000, inclusive.

Small dataset

$2 \le \mathbf{N} \le 100$.

Large dataset

$2 \le \mathbf{N} \le 1000$.
$2 \le \mathbf{K} \le 100$.

Sample

Input

```
3
10 2
1 2 3 4 5 6 7 8 9
100 100
-100
7 3
0 12 0 12 0
```

Output

```
Case #1: 5
Case #2: 0
Case #3: 12
```

In Case #1, the smoothed sequence is:

0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5

The integer sequence that gives the smallest difference is:

0, 1, 1, 2, 2, 3, 3, 4, 4, 5

Note that the sequence:

0.5, 0.5, 1.5, 1.5, 2.5, 2.5, 3.5, 3.5, 4.5, 4.5

Would give the same smoothed sequence with a maximum difference of 4, but this is not a valid answer because the original temperatures are known to have been integers.

In Case #2, all we know is that the sum of the 100 original values was -100. It's possible that all of the original values were exactly -1, in which case the difference between the largest and smallest temperatures would be 0, which is as small as differences get!

In Case #3, the original sequence could have been:

-4, 8, -4, 8, -4, 8, -4