CODEFORCES
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HOME   TOP   CATALOG   CONTESTS   GYM   PROBLEMSET   GROUPS   RATING   EDU   API   CALENDAR   HELP

PROBLEMS   SUBMIT CODE   MY SUBMISSIONS   STATUS   STANDINGS   CUSTOM INVOCATION

A. Letter Home

time limit per test: 1 second

memory limit per test: 256 megabytes

You are given an array of distinct integers $x_1, x_2, \ldots, x_n$ and an integer s.

Initially, you are at position $pos = s$ on the X axis. In one step, you can perform exactly one of the following two actions:

- Move from position pos to position $pos + 1$.
- Move from position pos to position $pos - 1$.

A sequence of steps will be considered successful if, during the entire journey, you visit each position x_i on the X axis at least once. Note that the initial position $pos = s$ is also considered visited.

Your task is to determine the minimum number of steps in any successful sequence of steps.

Input

Each test consists of multiple test cases. The first line contains a single integer t ($1 \le t \le 1000$) — the number of test cases. The description of the test cases follows.

The first line of each test case contains two integers n and s ($1 \le n \le 10, 1 \le s \le 100$) — the number of positions to visit and the starting position.

The second line of each test case contains n integers $x_1, x_2, \ldots, x_n$ ($1 \le x_i \le 100$). It is guaranteed that for all $1 \le i < n$, it holds that $x_i < x_{i+1}$.
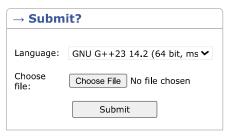
Output

For each test case, output the minimum number of steps in any successful sequence of steps.

Example

input

```
12
1 1
1
1 2
1
1 1
2
2 1
2 3
2 2
1 3
2 3
1 2
3 1
1 2 3
3 2
1 3 4
3 3
1 2 3
4 3
1 2 3 10
5 5
1 2 3 6 7
6 6
1 2 3 9 10 11
```

output

```
0
1
1
2
3
2
2
4
2
11
8
15
```

Note

In the first test case, no steps need to be taken, so the only visited position will be 1.

In the second test case, the following path can be taken: $2 \to 1$. The number of steps is 1.

In the third test case, the following path can be taken: $1 \to 2$. The number of steps is 1.

In the fifth test case, the following path can be taken: $2 \to 1 \to 2 \to 3$. The number of steps is 3.