



The Equalizing Array

Problem Statement

Oski is given an array A containing N positive integers and a positive integer X .

In one operation, Oski may choose an index i ($1 \leq i \leq N$) and perform exactly one of the following actions:

1. Increase A_i by X , changing it to $A_i + X$.
2. Decrease A_i by X , changing it to $A_i - X$, provided that the resulting value is still positive.

Oski wants to make all elements of the array equal. Determine whether this is possible. If it is possible, find the **minimum total number of operations** required. Otherwise, output -1 .

Input Format

The first line contains an integer T ($1 \leq T \leq 100$), the number of test cases.

Each test case consists of two lines:

- The first line contains two integers N and X ($1 \leq N \leq 10^4$, $1 \leq X \leq 10^9$).
- The second line contains N space-separated integers $A_1, A_2, \dots, A_N$ ($1 \leq A_i \leq 10^9$).

The sum of N over all test cases does not exceed $2 \cdot 10^5$.

Output Format

For each test case, print one integer: the minimum number of operations needed to make all array elements equal, or -1 if it is impossible.

Sample Input

```
3
4 3
2 8 5 11
3 2
1 4 7
5 5
10 10 10 10 10
```

Sample Output

```
4
-1
0
```

Explanation

Test Case 1

One optimal way is to make every element equal to 5:

- $2 \rightarrow 5$: 1 operation
- $8 \rightarrow 5$: 1 operation
- $5 \rightarrow 5$: 0 operations
- $11 \rightarrow 5$: 2 operations

The total is $1 + 1 + 0 + 2 = 4$ operations.

Test Case 2

There is no possible sequence of operations to make all elements equal. Therefore, the answer is -1 .

Test Case 3

All elements are already equal to 10, so no operations are needed. The answer is 0.