

B. Polo the Penguin and Matrix

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Little penguin Polo has an $n \times m$ matrix, consisting of integers. Let's index the matrix rows from 1 to n from top to bottom and let's index the columns from 1 to m from left to right. Let's represent the matrix element on the intersection of row i and column j as a_{ij} .

In one move the penguin can add or subtract number d from some matrix element. Find the minimum number of moves needed to make all matrix elements equal. If the described plan is impossible to carry out, say so.

Input

The first line contains three integers n , m and d ($1 \leq n, m \leq 100$, $1 \leq d \leq 10^4$) — the matrix sizes and the d parameter. Next n lines contain the matrix: the j -th integer in the i -th row is the matrix element a_{ij} ($1 \leq a_{ij} \leq 10^4$).

Output

In a single line print a single integer — the minimum number of moves the penguin needs to make all matrix elements equal. If that is impossible, print "-1" (without the quotes).

Examples

input
2 2 2 2 4 6 8
output
4
input
1 2 7 6 7
output
-1

→ Attention

Package for this problem was not updated by the problem writer or Codeforces administration after we've upgraded the judging servers. To adjust the time limit constraint, solution execution time will be multiplied by 2. For example, if your solution works for 400 ms on judging servers, then value 800 ms will be displayed and used to determine the verdict.

Codeforces Round #177 (Div. 2)

Finished

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.



Start virtual contest

→ Problem tags

brute force dp implementation sortings
ternary search

No tag edit access

→ Contest materials

- Announcement #1 
- Announcement #2 
- Tutorial 