Sumas no divisibles

Berta and Blanca have n cards, each with a positive integer b_i. Berta proposes a game: she will choose a positive integer m and then Blanca will have to deal the n cards in separate piles; after that, Berta will choose two cards from the same pile: if the sum of the values b_i and b_j of the cards she has chosen is divisible by m Berta will win, if it is not divisible by m Blanca will win.

The piles must contain at least 2 cards and there can be only one pile with n cards.

Blanca wants to know if she can deal the cards in piles in such a way that it is impossible for Berta to win and, if it is possible, she wants to do it with the minimum number of piles possible.

Given n, m and the n values b_i of the cards determine whether Blanca can win and the minimum number of piles she needs to do so.

Input

In the first line we will have two numbers n and m, which indicate respectively the number of cards and the number chosen by Berta.

In the next line will come n numbers $b_1, \ldots, b_n$, representing b_i the number of the i-th card.

Output

For each case a line is written, indicating the minimum number of piles Blanca needs to win or -1 in case Berta always wins.

Examples

Example 1

Input:

```
5 4
6 2 5 4 7
```

Output:

```
2
```

Explanation case 1

If Blanca makes only one pile, Berta can choose $6 + 2 = 8$ or $5 + 7 = 12$ which are divisible by 4.

If she makes the piles (6,4,7) and (2,5) we can see that Berta cannot win.

Example 2

Input:

```
4 3
9 15 3 12
```

Output:

```
-1
```

Explanation case 2

All numbers are divisible by 3 and therefore the sum of any pair of them will also be divisible by 3. No matter how Blanca makes the piles, Berta will always win.

Example 3

Entrada:

```
6 6
1 2 3 4 5 6
```

Salida:

```
2
```

Constraints

$2 \leq n \leq 3 \cdot 10^5$.
$1 \leq m \leq 10^9$.
$1 \leq b_i \leq 10^9$.

Subtasks

1. (25 points) $n \leq 15$.

2. (15 points) All answers would be 1 or -1.

3. (5 points) $n = m$ and $b_i = i$ for all letters.

4. (25 points) $n \leq 10^3$.

5. (30 points) No additional restrictions.