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Gerrymander

Problem Code: GERMANDE

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The country of BitLand is divided into N districts, and these districts are arranged in a circle: $1, 2, 3, \dots, N$, where i and $i+1$ are adjacent for all $1 \leq i \leq N-1$, and also 1 and N are adjacent. It is given that $N = o_1 * o_2$, where o_1 and o_2 are odd integers.

There are only 2 political parties in BitLand: the Zeros and the Ones. There was an election, in which each district chose its representative who is either a Zero or a One. We know this data. i.e. for each of the N districts, we know whether their representative is a Zero or a One.

The N districts should be partitioned into o_1 states, where each state consists of o_2 consecutive districts.

For example, if $o_1 = 5$ and $o_2 = 3$, then $N = 15$, and $\{1, 2, 3\}$ would be a valid state. $\{2, 3, 4\}$, $\{13, 14, 15\}$, $\{14, 15, 1\}$, $\{15, 1, 2\}$ are other examples of valid states. But $\{3, 5, 6\}$ is not a valid state, because the districts are not consecutive.

A state gets a One Governor if, among all the o_2 district representatives belonging to it, there are more One district representatives than Zero representatives. And it gets a Governor who is from the Zero party, if the majority of its district representatives are from the Zero party. And because o_2 is odd, there will be no ties.

The President of BitLand will be a One if the majority of the o_1 state Governors are Ones. Otherwise, the President will be from the Zero party.

But the state boundaries have not been fixed yet. Given just the district-wise data (i.e. whether each district's representative is a Zero or a One), you need to find if there is a way to partition them into states such that the President is a One.

Input

- The first line contains one integer, T , which is the number of testcases.
- The first line of each testcase contains two space separated integers, o_1 and o_2 , which are the number of states, and number of districts in each state, respectively.
- The next line of each testcase contains $N = o_1 * o_2$ space separated integers: d_1, d_2, \dots, d_N . If d_i is 1, then it signifies that District i has chosen a One representative. If d_i is 0, then they have a Zero representative.

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- Each testcase should be in a new line, and should contain **1**, if the President can be a One, and **0** otherwise.

Constraints

For all subtasks you may assume that:

- $1 \leq T \leq 100$
- o_1, o_2 will be odd positive integers.
- $1 \leq \text{Summation of } o_1 * o_2 \text{ over all testcases} \leq 10^6$
- $0 \leq d_i \leq 1$

Subtask 1: For 10% of the score,

- $1 \leq \text{Summation of } o_1 * o_2 \text{ over all testcases} \leq 10^4$

Subtask 2: For further 20% of the score,

- $1 \leq o_1 \leq 10^4$
- $1 \leq o_2 \leq 10^2$

Subtask 3: For further 70% of the score,

- No further constraints.

Example

Input :

```
4
5 1
1 0 0 1 1
3 3
0 0 1 1 0 1 1 0 0
3 3
1 1 1 0 1 0 0 1 0
3 3
1 0 0 1 1 0 1 0 0
```

Output :

```
1
1
1
0
```

Explanation

In the first testcase, each state should have only 1 district, and hence, there is no actual choice in constructing the states. There will be three One Governors, and two Zero Governors, and hence the President will be a One.

In the second testcase, each of the three states should have 3 districts each. Consider the following partitioning of the districts into states: {2,3,4}, {5,6,7} and {8,9,1}. So, the first state consists of the districts {2,3,4}, and the representatives of these correspond to {0,1,1}. The majority is One, and hence the first state will have a One Governor. The representatives corresponding to the second state are {0,1,1}, and so again, this will have a One Governor. The third state has representatives {0,0,0}, and hence will have a Zero Governor. On the whole, there are two One Governors, and one

Zero Governor, and hence the President will be a One. And since there is a way to partition the districts into states, in which the President is a One, the answer is 1.

In the third testcase, each of the three states should have 3 districts each. Consider the following partitioning of the districts into states: {3,4,5}, {6,7,8} and {9,1,2}. So, the first state consists of the districts {3,4,5}, and the representatives of these correspond to {1,0,1}. The majority is One, and hence the first state will have a One Governor. The representatives corresponding to the second state are {0,0,1}, and since the majority is Zero, this will have a Zero Governor. The third state has representatives {0,1,1}, and as Ones are in majority, this will have a One Governor. On the whole, there are two One Governors, and one Zero Governor, and hence the President will be a One. And since there is a way to partition the districts into states, in which the President is a One, the answer is 1.

In the fourth testcase, you can check that no matter how you construct the states, the President cannot be a One. Hence, the answer is 0.

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Time Limit: 1 secs

Source Limit: 50000 Bytes

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