Math I

You are given n integers a_1, a_2 ... a_n (0<=a_i<=n). The sum $a_1 + a_2 + ... + a_n$ does not exceeded n. Your task is to find n other integers x_1, x_2 ... x_n (note that x_i may be negative numbers) satisfying the following conditions:

- ($x_i - x_{i+1} + a_{i+1} = 0$) or ($x_i - x_{i+1} + a_{i+1} = 1$) for i=1..n-1
- ($x_n - x_1 + a_1 = 0$) or ($x_n - x_1 + a_1 = 1$)
- $|x_1|+|x_2|+ ... +|x_n|$ is minimized

Input

The first line of the input file contains an integer t representing the number of test cases (t<=20). Then t test cases follow. Each test case has the following form:

- The first line contains n (1<=n<=1000)
- The second line contains n integers a_1, a_2 ... a_n separated by single spaces

Output

For each test case output a single value: the minimum value of $|x_1|+|x_2|+ ... +|x_n|$

Example

Input:
2
4
2 1 0 0
5
0 1 2 2 0

Output:
1
3

Explanation

In the former case, the optimal solution is (x_1=0, x_2=0, x_3=0, x_4=-1)

In the latter case, the optimal solution is (x_1=-1, x_2=-1, x_3=0, x_4=1, x_5=0)