

# Mashup

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            2 seconds  
Memory limit:         256 megabytes

Nike Nirzayanov, the founder of the popular competitive typing platform SpeedForces, has recently added a new feature allowing users to create random mashups of past contests.

A contest on SpeedForces consists of  $N$  implementation problems, each with a difficulty rating among  $\{800, 900, 1000, 1100, 1200\}$ . The  $N$  problems in a single contest are always arranged in nondecreasing order of difficulty and assigned problem slots from 1 to  $N$  in order.

Busy Beaver is testing out the new feature. He first specifies  $N$  past contests, where the  $i$ -th contest he specifies has  $a_{ij}$  problems of difficulty  $800 + 100(j - 1)$  for each  $1 \leq j \leq 5$ , where  $\sum_{j=1}^5 a_{ij} = N$ .

The feature will select a random permutation  $p_1, p_2, \dots, p_N$  of  $1, 2, \dots, N$  and generate for Busy Beaver a contest where the  $i$ -th problem is the  $i$ -th problem in the  $p_i$ -th contest he specified.

Busy Beaver wonders: How many such permutations will result in a contest with reverse difficulty order (i.e., the problem difficulties are in nonincreasing order)? For some reason, he only wants the answer **modulo 2**.

## Input

Each test contains multiple test cases. The first line contains the number of test cases  $T$  ( $1 \leq T \leq 10^4$ ). The description of the test cases follows.

The first line of each test case contains the integer  $N$  ( $1 \leq N \leq 2 \cdot 10^5$ ) — the number of past contests and problems.

The next  $N$  lines of each test case each contain 5 integers  $a_{i1}, a_{i2}, a_{i3}, a_{i4}, a_{i5}$  ( $a_{ij} \geq 0$  and  $\sum_{j=1}^5 a_{ij} = N$ ).

It is guaranteed that the sum of  $N$  across all test cases is no more than  $2 \cdot 10^5$ .

## Output

For each test case, output a single integer, the number of such permutations modulo 2.

## Scoring

There are five subtasks for this problem. Let  $\sum N$  be the sum of  $N$  across all test cases. Let  $K$  be the largest  $j$  such that  $a_{ij} > 0$  for some  $1 \leq i \leq N$ .

- (10 points):  $K \leq 2$ .
- (20 points):  $K \leq 3$ ,  $\sum N \leq 500$ .
- (20 points):  $K \leq 3$ .
- (25 points):  $\sum N \leq 500$ .
- (25 points): No additional constraints.

## Example

standard input	standard output
3	0
3	1
1 2 0 0 0	1
0 3 0 0 0	
0 0 3 0 0	
4	
4 0 0 0 0	
1 3 0 0 0	
0 3 1 0 0	
0 2 2 0 0	
1	
1 0 0 0 0	

## Note

In the first test case, the  $N = 3$  past contests have the following problem difficulties:

- Contest 1: 800, 900, 900.
- Contest 2: 900, 900, 900.
- Contest 3: 1000, 1000, 1000.

There are 2 permutations  $p$  that result in a reverse difficulty order contest:  $p = [3, 1, 2]$  and  $p = [3, 2, 1]$ . Therefore, the answer is  $2 \bmod 2 = 0$ .

In the second test case, the  $N = 4$  past contests have the following problem difficulties:

- Contest 1: 800, 800, 800, 800.
- Contest 2: 800, 900, 900, 900.
- Contest 3: 900, 900, 900, 1000.
- Contest 4: 900, 900, 1000, 1000.

There are 3 permutations  $p$  that result in a reverse difficulty order contest:  $p = [3, 4, 2, 1]$ ,  $p = [4, 2, 3, 1]$ , and  $p = [4, 3, 2, 1]$ . Therefore, the answer is  $3 \bmod 2 = 1$ .

In the third test case, the only permutation  $p = [1]$  generates a reverse difficulty order contest, so the answer is  $1 \bmod 2 = 1$ .