

Prefix Mahjong

Input file: **standard input**
Output file: **standard output**
Time limit: **2 seconds**
Memory limit: **1024 megabytes**

A positive integer multiset s is a “Pong” if $s = \{x, x, x\}$ for some positive integer x .

A positive integer multiset s is a “Chow” if $s = \{x, x + 1, x + 2\}$ for some positive integer x .

A positive integer multiset s is an “Eyes” if $s = \{x, x\}$ for some positive integer x .

A positive integer sequence is a “Mahjong” if it can be divided into some (possibly zero) “Pong”s, some (possibly zero) “Chow”s, and **exactly one** “Eyes”.

For example, sequence $s = \{1, 1, 4, 5, 1, 4, 4, 3\}$ is a “Mahjong” because it can be divided into $\{1, 1, 1\}$, $\{4, 5, 3\}$, $\{4, 4\}$.

For each prefix of a given positive integer sequence, determine if it is a “Mahjong”.

Input

Each test contains multiple test cases. The first line contains a single integer t ($1 \leq t \leq 10^5$), denoting the number of test cases.

For each test case, the only line contains an integer n ($1 \leq n \leq 10^5$) and the following n positive integers a_1, a_2, \dots, a_n ($1 \leq a_i \leq 10^9$), denoting the length of the integer sequence and the elements of the positive integer sequence, respectively.

It is guaranteed that the sum of n over all testcases does not exceed 10^5 .

Output

For each test case, print a string consisting of ‘0’ and ‘1’ in one line. The i -th character is ‘1’ if the prefix of length i is a “Mahjong”; otherwise it is ‘0’.

Examples

standard input	standard output
4 8 1 1 4 5 1 4 4 3 14 1 1 3 5 4 2 5 5 4 6 6 2 2 4 17 3 5 3 2 2 3 3 1 4 3 1 3 3 5 2 4 4 8 2 4 11 11 14 8 6 3	01000001 01001001000001 00000000001000001 00000000
10 2 1 1 3 1 1 1 3 1 2 3 5 1 1 1 1 1 5 1 1 1 2 2 5 1 1 1 2 3 8 1 1 1 1 1 1 2 3 5 2 2 1 1 1 5 3 2 1 1 1 8 3 2 1 1 1 1 1 1	01 010 000 01001 01001 01001 01001001 01001 00001 00001001