

## B. Fibonacci Cubes

time limit per test: 2 seconds  
 memory limit per test: 512 megabytes

There are  $n$  Fibonacci cubes, where the side of the  $i$ -th cube is equal to  $f_i$ , where  $f_i$  is the  $i$ -th Fibonacci number.

In this problem, the Fibonacci numbers are defined as follows:

- $f_1 = 1$
- $f_2 = 2$
- $f_i = f_{i-1} + f_{i-2}$  for  $i > 2$

There are also  $m$  empty boxes, where the  $i$ -th box has a width of  $w_i$ , a length of  $l_i$ , and a height of  $h_i$ .

For each of the  $m$  boxes, you need to determine whether all the cubes can fit inside that box. The cubes must be placed in the box following these rules:

- The cubes can only be stacked in the box such that the sides of the cubes are parallel to the sides of the box;
- Every cube must be placed either on the bottom of the box, or on top of other cubes in such a way that all space below the cube is occupied;
- A larger cube cannot be placed on top of a smaller cube.

### Input

Each test consists of several test cases. The first line contains a single integer  $t$  ( $1 \leq t \leq 10^3$ ) — the number of test cases. The description of the test cases follows.

In the first line of each test case, there are two integers  $n$  and  $m$  ( $2 \leq n \leq 10, 1 \leq m \leq 2 \cdot 10^5$ ) — the number of cubes and the number of empty boxes.

The next  $m$  lines of each test case contain 3 integers  $w_i$ ,  $l_i$ , and  $h_i$  ( $1 \leq w_i, l_i, h_i \leq 150$ ) — the dimensions of the  $i$ -th box.

Additional constraints on the input:

- The sum of  $m$  across all test cases does not exceed  $2 \cdot 10^5$ .

### Output

For each test case, output a string of length  $m$ , where the  $i$ -th character is equal to "1" if all  $n$  cubes can fit into the  $i$ -th box; otherwise, the  $i$ -th character is equal to "0".

### Example

input	Copy
2	
5 4	
3 1 2	
10 10 10	
9 8 13	
14 7 20	
2 6	
3 3 3	
1 2 1	
2 1 2	
3 2 2	
2 3 1	
3 2 4	
output	Copy
0010	
100101	

### Note

In the first test case, only one box is suitable. The cubes can be placed in it as follows:

### Educational Codeforces Round 179 (Rated for Div. 2)

Contest is running

01:08:09

Contestant



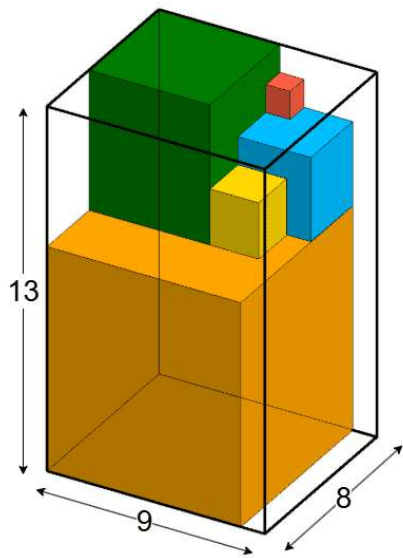
### → Submit?

Language: GNU G++23 14.2 (64 bit, ms) ▼

Choose file:  No file chosen

### → Last submissions

Submission	Time	Verdict
<a href="#">322711848</a>	Jun/03/2025 18:26	Accepted



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