Problem F. Faraway

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	512 mebibytes

A squad of n soldiers is dispatched to somewhere in Byteland. Currently, i-th soldier is at location (x_i, y_i). The soldiers are going to set off now, but the target location is not so clear.

Assume the target location is at (x_e, y_e). It is clear for all soldiers that x_e and y_e are both non-negative integers within the range $[0, m]$. Apart from that, for i-th soldier, the only thing he knows is that $(|x_i - x_e| + |y_i - y_e|)$ mod $k_i = t_i$.

To find the correct target location, these soldiers are working on the information they have now. Please write a program to figure out the number of possible target locations.

Input

The first line of the input contains an integer T $(1 \le T \le 10)$, denoting the number of test cases.

Each test case starts with a line containing two integers n and m $(1 \le n \le 10, 1 \le m \le 10^9)$, denoting the number of soldiers and the upper bound for x_e and y_e.

Each of the next n lines contains four integers, x_i, y_i, k_i, and t_i $(0 \le x_i, y_i \le m, 2 \le k_i \le 5, 0 \le t_i < k_i)$, denoting what i-th soldier knows.

Output

For each test case, print a single line containing a single integer: the number of possible target locations.

Example

standard input	standard output
2	10
2 5	0
1 2 4 2	
3 1 2 1	
2 5	
1 2 4 2	
1 2 4 3	