Problem A. Fibonacci in the Pocket

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

DreamGrid has just found a Fibonacci sequence $f_1, f_2, \ldots$ and two integers a and b in his right pocket, where f_k indicates the k-th element in the Fibonacci sequence.

Please tell DreamGrid if $\sum_{i=a}^{b} f_i$ is even or is odd.

Recall that a Fibonacci sequence is an infinite sequence which satisfies $f_1 = 1$, $f_2 = 1$ and $f_i = f_{i-1} + f_{i-2}$ for all $i \geq 3$.

Input

There are multiple test cases. The first line of the input contains an integer T (about 100), indicating the number of test cases. For each test case:

The first and only line contains two integers a and b ($1 \leq a \leq b < 10^{10000}$). Their meanings are described above.

Output

For each test case output one line. If $\sum_{i=a}^{b} f_i$ is even output "0" (without quotes); If $\sum_{i=a}^{b} f_i$ is odd output "1" (without quotes).

Example

standard input	standard output
6 1 2 1 3 1 4 1 5 123456 12345678987654321 123 20190427201904272019042720190427	0 0 1 0 0 1

Note

The first few elements of the Fibonacci sequence are: $f_1 = 1$, $f_2 = 1$, $f_3 = 2$, $f_4 = 3$, $f_5 = 5$, $f_6 = 8$...