Fun with 1010

When you look at photographs of watches and clocks, you'll find that they almost always show the time 10:10. There are lots of theories and even urban legends about this. For example, when showing 10:10, the hands look like a smile, and so you are more inclined to buy the watch or clock :D (a form of subliminal advertising).

Now, you are given N and M. You are to find the number of sequences $A_1, A_2, \ldots, A_N$ such that:

- A_1 is a number of the form 1010^K for some $1 \leq K \leq M$,
- If $P = A_2 \cdot A_3 \cdots A_N$, then A_1 is divisible by P, and P is divisible by 1010, and
- $A_2, A_3, \ldots, A_N$ are squarefree.

Since the number can be very large, only give the number modulo 2000003.

Input Format
The first line of input contains a single integer T, which is the number of test cases. The following lines contain the test cases.

Each test case consists of one line containing two integers, N and M.

Constraints
$1 \leq T \leq 10^5$
$2 \leq N \leq M \leq 10^{12}$

Output Format
For each test case, output a single line containing the answer.

Sample Input

```
2
2 3
3 3
```

Sample Output

```
3
62
```

Explanation
For the first test case, the possible sequences are:
$\{1010, 1010\}$,
$\{1020100, 1010\}$,
$\{1030301000, 1010\}$