Almost-isosceles Pythagorean triple (easy)

(3, 4, 5) is the smallest almost-isosceles Pythagorean triple, as **4 - 3 = 1**.
Let **S = { (*a*, *a*+1, *c*) | $a^2 + (a+1)^2 = c^2$ with *a* and *c* positive integers}**.
One can prove that the set **S** of almost-isosceles Pythagorean triples is infinite.
There is an obvious total order on this set.

Input

The first line of input contains an integer ***T***, the number of test cases.
On each of the next ***T*** lines, your are given two integers ***n*** and ***m***.

Output

For each test case, you have to find the ***n***th triple **(*a*, *a*+1, *c*)** in the ordered set **S**, and print ***a*** and ***c***. As the answer could not fit in a 64-bit container, simply output your answer modulo ***m***.

Example

Input:
3
1 10
2 123
4 289

Output:
3 5
20 29
118 118

Constraints

0 < T < 10^4
0 < n < 10^18
1 < m < 10^9

~~For your information, my 500B-python3 code get AC in 1.61s with 12MB of memory print.~~
~~In Python2.7 : (2.49s, 4.0MB), in Python2+psyco (2.04s, 36MB).~~
~~My 1kB C code ran in (0.04s, 1.6MB), and time limit is ×125 this one.~~
Have fun ;-)
(edit) With wisfaq observation, all my best timings are divided by exactly two!!!
(Edit 2017-02-11, new TL with new compiler. TL 1.11s, in the third (0.37s) my Python3 code ends.)