Problem A. Lysergic Acid Diethylamide

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

might or might not had been used during making of this problem.

In this problem **functions** are implictly assumed to have a single non-negative integer as an argument and produce a single non-negative integer as a result.

f is a function. $f(x) = 1 + 2 + \ldots + x$. More formally, $f(x)$ is the sum of all positive integers less than or equal to x.

s_k is a family of functions. s_0 is an identity function ($s_0(x) = x$) and $s_k(x) = s_{k-1}(f(x) + k)$.

You are given t test cases. i-th test case contains three integers x_i, k_i and p_i. For each test case find an integer m_i such that $-1 \le m \le p_i - 1$, $s_{k_i}(x_i) \bmod p_i \not\equiv m_i$. You may use $m_i = -1$ no more than 20 times. p_i are pairwise distinct. Note, that $a \bmod p \ge 0$, where a is an arbitrary integer, so $m_i = -1$ is correct for any particular test case.

Why would you do that? It's simple. Finding correct answers is easy and conformist. On the other hand, finding incorrect answers is challenging and original. However, in this problem it's a bit too challenging, because of $p = 1$ case. So you decided, that you will skip some test cases with $m_i = -1$ wildcard. Sounds reasonable (not).

Input

The first line of input contains a single integer t ($1 \le t \le 5000$) — the number of test cases.

t lines follow. i-th of them contains three integers x_i, k_i, p_i ($1 \le x_i \le 10^9, 0 \le k_i \le 10^5, 1 \le p_i \le 10^4$).

It is guaranteed that $\forall_{i \ne j}\ p_i \ne p_j$.

Output

Output t integers. i-th of them should be equal to m_i.

The number of indices i such that $m_i = -1$ should not exceed 20.

Examples

standard input	standard output
3 4 0 1 2 2 2 4 1 3	-1 1 0
2 1 3 2 6 0 3	-1 1
2 1 3 2 2 2 3	0 2