

String Master

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



Rousong the Fox is a string master who can handle a wide variety of strings with ease. For example, he can braid noodles with his tongue. Likewise, he is good with string data types in computer programming.

One night, Rousong has a dream, in which he picks an infinitely long string out of the bowl when eating noodles. On closer inspection, it is a binary string containing only zeros and ones, concatenated by $0, 1, 10, 11, \dots$. Formally, let's define string $s^0 = 0$, and $s^i = s^{i-1} + (i)_2$ for each integer $i > 0$, where $a + b$ denotes the concatenation of string a and b , and $(i)_2$ denotes the binary form of integer i without leading zeros. Consequently, the infinitely long string Rousong dreamed of is $s^\infty = 011011100101\dots$

Since the length of s^∞ is too large, Rousong only wants to focus on the substring from the l -th character to the r -th character, denoted as $s_{l,r}^\infty$. He wants to find the substring of length n within the string $s_{l,r}^\infty$ with the largest lexicographical order. Formally, please find the index i within $l \leq i \leq r - n + 1$ that maximizes the lexicographical order of $s_{i,i+n-1}^\infty$. Can you help Rousong solve this problem before he wakes up?

For two binary strings of the same length a and b , we say that string a is lexicographically greater than string b if for the first index i where a and b differ, the i -th character of a is 1 and of b is 0.

Input

The first line contains an integer T ($1 \leq T \leq 100$), indicating the number of test cases.

Each test case contains three integers l, r, n ($1 \leq l \leq r \leq 10^{18}$, $1 \leq n \leq \min(r - l + 1, 10^6)$) in a single line, indicating the range to be focused on and the length of the substring.

It is guaranteed that $\sum n \leq 10^6$ over all test cases.

Output

For each test case, output the substring with the largest lexicographical order in a single line.

Example

standard input	standard output
6	110
6 13 3	011011100
1 9 9	1111111111
1 1451419198 10	111111111100000000010
987 6543 21	1111111111111111000000000000000100
1123 581321 34	000111110011010000
1000010 1000030 18	

Note

For the first test case of the sample, $s^\infty = 011011100101110111\dots$, so $s_{6,13}^\infty = 11001011$. The substrings

of length 3 are 110, 100, 001, 010, 101, 011. The one with the largest lexicographical order is 110.