Problem G. Garrafeira

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

Let's define $f(a_1, a_2, \ldots, a_n)$ as follows:

1. Consider all 2^n subsequences of sequence $\{a_1, a_2, \ldots, a_n\}$;
2. For every subsequence, calculate the bitwise XOR of all its elements;
3. Define f as the sum of 2^n bitwise XORs we got in previous stage.

For example, $f(1, 2, 3) = 0 + 1 + 2 + 3 + (1 \oplus 2) + (1 \oplus 3) + (2 \oplus 3) + (1 \oplus 2 \oplus 3) = 12$. Here, $a \oplus b$ is the bitwise XOR of the integers a and b.

Consider values of $f(a_1, \ldots, a_n)$ for all possible arguments where $l \le a_i \le r$. How many different numbers are present among these values?

Input

You are given an integer T ($1 \le T \le 10^5$) on the first line: the number of test cases.

Each of the following T lines contains integers n, l and r ($1 \le n \le 100$, $0 \le l \le r \le 10^{18}$).

Output

For each test case, print a single line with one integer: the answer to the problem modulo $10^9 + 7$.

Example

standard input	standard output
3 2 10 11 3 1 3 3 3 4	2 3 3