Problem 1: Nbits

How many different integers between A and B (including A and B) have exactly N bits of 1 in the two's complement representation? That's the question to be answered in this problem.

Example

The problem is pretty clear. For example, suppose A is 5, B is 14, and N is 2. If we look at the two's complement binary representation of the integers between 5 and 14 and identify those with exactly 2 one bits, we find that there are five such numbers (identified by the left-pointing arrows)[1]:

5	0 1 0 1 ←	10	1 0 1 0 ←
6	0 1 1 0 ←	11	1 0 1 1
7	0 1 1 1	12	1 1 0 0 ←
8	1 0 0 0	13	1 1 0 1
9	1 0 0 1 ←	14	1 1 1 0

So the answer for this case would be 5.

Input

There will be multiple input cases to consider. For each case there will be a single input line containing A, B, and N. The input for the last case will be followed by a line containing three zeroes. A and B will each be in the range -2147483648 to +2147483647, and N will be in the range 1 to 32.

Output

For each input case, display the case number (1, 2, …) and the appropriate number. Display a blank line after the output for each case. The sample input and output illustrate the appropriate formats.

Sample Input	Output for the Sample Input
5 14 2 5 14 3 -1 1 1 0 0 0	Case 1: 5 numbers Case 2: 4 numbers Case 3: 1 numbers

[1] All the high-order bits in these numbers are 0; they are not shown for clarity.