Problem C

Counting ones

Carl is right now the happiest child in the world: he has just learned this morning what the binary system is. He learned, for instance, that the binary representation of a positive integer k is a string $a_n a_{n-1} \cdots a_1 a_0$ where each a_i is a binary digit 0 or 1, starting with $a_n = 1$, and such that $k = \sum_{i=0}^{n} a_i \times 2^i$. It is really nice to see him turning decimal numbers into binary numbers, and then adding and even multiplying them.

Caesar is Carl's older brother, and he just can't stand to see his little brother so happy. So he has prepared a challenge: "Look Carl, I have an easy question for you: I will give you two integers A and B, and you have to tell me how many 1's there are in the binary representation of all the integers from A to B, inclusive. Get ready". Carl agreed to the challenge. After a few minutes, he came back with a list of the binary representation of all the integers from 1 to 100. "Caesar, I'm ready". Caesar smiled and said: "Well, let me see, I choose $A = 10^{15}$ and $B = 10^{16}$. Your list will not be useful".

Carl hates loosing to his brother so he needs a better solution fast. Can you help him?

Input

A single line that contains two integers A and B $(1 \le A \le B \le 10^{16})$.

Output

Output a line with an integer representing the total number of digits 1 in the binary representation of all the integers from A to B, inclusive.

Sample input 1	Sample output 1
1000000000000000 10000000000000000	239502115812196372

Sample input 2	Sample output 2
2 12	21

Sample input 3	Sample output 3
9007199254740992 9007199254740992	1