B. New Year and Old Property

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

The year 2015 is almost over.

Limak is a little polar bear. He has recently learnt about the binary system. He noticed that the passing year has exactly one zero in its representation in the binary system — $2015_{10} = 11111011111_2$. Note that he doesn't care about the number of zeros in the decimal representation.

Limak chose some interval of years. He is going to count all years from this interval that have exactly one zero in the binary representation. Can you do it faster?

Assume that all positive integers are always written without leading zeros.

Input

The only line of the input contains two integers a and b ($1 \le a \le b \le 10^{18}$) — the first year and the last year in Limak's interval respectively.

Output

Print one integer – the number of years Limak will count in his chosen interval.

Examples

input
5 10
output
2

input
2015 2015
output
1

input
100 105
output
0

input
72057594000000000 72057595000000000
output
26

Note

In the first sample Limak's interval contains numbers $5_{10} = 101_2$, $6_{10} = 110_2$, $7_{10} = 111_2$, $8_{10} = 1000_2$, $9_{10} = 1001_2$ and $10_{10} = 1010_2$. Two of them (101_2 and 110_2) have the described property.

Desktop version, switch to mobile version.