B. New Year and Old Property

time limit per test: 2 seconds

memory limit per test: 256 megabytes

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	Copy
5 10	

output	Copy
2	

input	Copy
2015 2015	

output	Copy
1	

input	Copy
100 105	

output	Copy
0	

input	Copy
72057594000000000 72057595000000000	

output	Copy
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.

ICPC Assiut University Training - Juniors Phase 1 Sheets-2022

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→ Group Contests

- Juniors Phase 1 Practice #5 (Bitmask, Bitset, Bits)
- Juniors Phase 1 Practice #4 (Binary search , Two pointers)
- Juniors Phase 1 Practice #3 (STL 2)
- Juniors Phase 1 Practice #2 (STL 1)
- Juniors Phase 1 Practice #1 (Prefix sum , Frequency Array)

Juniors Phase 1 Practice #5 (Bitmask, Bitset, Bits)

Finished

Practice

→ About Time Scaling

This contest uses time limits scaling policy (depending on a programming language). The system automatically adjusts time limits by the following multipliers for some languages. Despite scaling (adjustment), the time limit cannot be more than 30 seconds. Read the details by the link.

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Submit?

Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
228260771	Oct/15/2023 10:55	Accepted
228141117	Oct/14/2023 11:58	Accepted
228138905	Oct/14/2023 11:43	Wrong answer on test 5