Q.U.A.R.K.

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C++ — 2 sec — 512 MB

The engineers at M.O.T.H.E.R. are working on a specialised component for their latest Quantum Computer: the Quasi-Useful Arithmetic Restriction Kontrol, or Q.U.A.R.K. for short. This component stores a single integer, which can be only altered using one of the following bit operations:

- Flipping the right most bit. (e.g. 0100 => 0101)

- Flipping the **i**th bit, if (and only if) the bit directly to the right is a 1 and all other bits to the right are 0. (e.g. 10100 => 11100)

Using these two operations, any positive integer can be converted to any other positive integer.

INPUT   You will be given two integers, **a** and **b**, denoting the number currently stored in the Q.U.A.R.K. and the new number to be stored, respectively.

$1 \leq$ **a**, **b** $\leq 2^{60}$

OUTPUT   Output a single integer, the smallest number of bit operations required to change the value stored in the Q.U.A.R.K. to the new number.

SAMPLE   For example, suppose the number 5 is currently stored in the Q.U.A.R.K. and this needs to be changed to the number 3. This can be achieved in 4 steps : 101 => 111 => 110 => 010 => 011. This is the smallest number of bit operations required.

INPUT	OUTPUT
9 0	14
123 321	303
55555 66666	91727