Problem C. Consecutive Reduction

Source file name:	Consecutive.c, Consecutive.cpp, Consecutive.java, Consecutive.py
Input:	`Standard`
Output:	`Standard`
Time / Memory limit:	`1/2/8 (C++/Java/Python) second(s) / 64 megabytes`
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Consider an infinite array of non-negative integers, where for each position i ($i \geq 0$), $a_i = i$. You are given several queries, each with a range $[l,\ r]$. For each query, you must answer how many operations are needed to make all elements in that range become zero.

An operation consists of selecting an a_i ($l \leq i \leq r,\ a_i \geq 1$). If a_i is even, divide it by 2; if it is odd, subtract 1.

Input

The first line contains a positive integer q $\left(1 \leq q \leq 10^5\right)$, indicating the number of queries. Each query consists of a line with two non-negative integers l r $\left(0 \leq l \leq r \leq 10^{12}\right)$.

Output

For each query, print a line indicating the number of operations needed to convert all the elements in the respective range to zero.

Example

Input	Output
5 0 8 5 7 9 9 2 10 6 13	26 13 5 35 40

Use fast I/O methods