Problem H. Primes

Input file:	*standard input*
Output file:	*standard output*
Time limit:	4 seconds
Memory limit:	256 mebibytes

This is an interactive problem.

For two positive integers x, y, we define $\pi(x, y)$ to be the number of distinct primes that divide both x and y. For example $\pi(2, 3) = 0$, $\pi(8, 16) = 1$ and $\pi(30, 105) = 2$.

For two positive integers a, b, where $a \le b$, we define $S(a, b)$ to be the sum of values $\pi(x, y)$ over all pairs of integers (x, y) satisfying $a \le x < y \le b$.

Your task is to compute the values $S(a, b)$ for many query pairs (a, b). To make your task more challenging, all the queries have to be answered online.

Input

The first line of the input contains a single integer q ($1 \le q \le 5 \cdot 10^4$), denoting the number of queries. The next q lines describe the queries. The i-th of these lines contains two integers a_i, b_i ($1 \le a_i \le b_i \le 10^6$).

Note that the i-the query ($i \ge 2$) will be available at the input only after you output the answer to the $(i - 1)$-th query.

Output

You should print exactly q lines. The i-th of these lines should contain the value $S(a_i, b_i)$.

Do not forget to flush the output after answering each query.

Example

standard input	standard output
4 1 5 6 6 3 9 1 500000	1 0 6 56529651093