A Simple MST Problem

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

For the positive integer x, we define the number of its different prime factors as $\omega(x)$. For example, $\omega(1) = 0, \omega(8) = 1, \omega(12) = 2$.

In this problem, we treat each positive integer as a node. When we build an edge between node x and node y, we will cost $\omega(lcm(x, y))$, where $lcm(x, y)$ represents the least common multiple of x and y.

Next, you will be given T queries. For the i-th query we will give two integers l_i, r_i. What you need to answer is, when only considering nodes $l_i, l_i + 1, \cdots r_i$, what is the minimum cost if we build edges so that these $r_i - l_i + 1$ nodes can reach each other.

Note that all of the queries are distinct and in i-th query you can only build an edge between x, y when $l_i \leq x, y \leq r_i$.

Input

The first line contains an integer $T (T \leq 50000)$, indicating the number of queries.

For the next T lines, the i-th line contains two integers $l_i, r_i (1 \leq l_i \leq r_i \leq 10^6)$, indicating a query.

It is guaranteed that $\sum_{i=1}^{T} r_i \leq 10^6$.

Output

For each query, output an integer as your answer.

Examples

standard input	standard output
5 1 1 4 5 1 4 1 9 19 810	0 2 3 9 1812
2 27 30 183704 252609	8 223092