

Problem E. Find Maximum

Input file: standard input
Output file: standard output
Time limit: 1 second
Memory limit: 512 megabytes

We define a function $f(x)$ over all non-negative integer x as follows:

$$f(x) = \begin{cases} 1 & (x = 0) \\ f(\frac{x}{3}) + 1 & (x > 0 \wedge x \bmod 3 = 0) \\ f(x - 1) + 1 & (x > 0 \wedge x \bmod 3 \neq 0) \end{cases}$$

Calculate $\max_{x=l}^r f(x)$.

You need to answer T queries independently.

Input

The first line contains a single integer T ($1 \leq T \leq 10^4$).

Each of the next T lines contains two integers l and r ($1 \leq l \leq r \leq 10^{18}$), representing a query.

Output

Output T lines. The i -th line contains a single integer, representing the answer to the i -th query.

Example

standard input	standard output
10	3
1 2	3
1 3	4
1 4	5
1 5	3
2 3	4
2 4	5
2 5	4
3 4	5
3 5	5
4 5	