DMOPC '15 Contest 5 P4 - Steins;Number

Time limit: 1.0s **Memory limit:** 64M

> "I am mad scientist, Hououin Kyouma!" - Okabe Rintarou

Most computer scientists are obsessed with powers of 2 and the binary number system. However, as a mad scientist, Okabe is instead obsessed with the powers of 3. He is especially passionate about the set of numbers that he refers to as *Steins;Numbers*. According to Okabe's definition, a number is a Steins;Number if it can be written as the sum of **distinct** powers of 3, including 1.

For example, 12 and 31 are both Steins;Numbers.

$$12 = 3^1 + 3^2$$

$$31 = 3^0 + 3^1 + 3^3$$

Okabe just boasted to Kurisu that he knows all the Steins;Numbers. Kurisu didn't believe him, so she asked him Q queries of the following form:

> Given numbers L and R, how many Steins;Numbers are between L and R, inclusive?

Okabe is nervous about making a mistake in his calculations. Wanting to impress Kurisu, he turned to you for help.

Constraints

Subtask 1 [20%]

$1 \leq Q \leq 100$

$1 \leq L \leq R \leq 10^9$

Subtask 2 [80%]

$1 \leq Q \leq 10\,000$

$1 \leq L \leq R \leq 10^{18}$

Input Specification

The first line of input will contain Q. Each of the next Q lines will contain a query of the form `L R`.

Output Specification

Output the answer to each query on a separate line.

Sample Input

```
1
9 12
```

Sample Output

```
3
```

Explanation

9, 10, and 12 are the three Steins;Numbers in the given range.