# The art of tree numbers

A number is called a tree_num while it can be partition into sum of some distinct powers of 3 with natural exponent. Example : 13 and 90 are tree_num because $13 = 3^2 + 3^1 + 3^0$, $90 = 3^4 + 3^2$.

Let *tree_num*(*i*) be the i-th largest tree_num.

Example : *tree_num*(1) = 1, *tree_num*(2) = 3, *tree_num*(5) = 10, …

Let

$$F(L, R) = \sum_{i=L}^{R} tree\_num(i)$$

Your task is to find F(L, R) with some given L, R.

## Input

- First line : an integer T – number of testcases ($1 \le T \le 100000$)

- Next T lines : each line contains two number – L and R ($1 \le L \le R \le 10^{18}$)

## Output

- For each pair (L, R), output a line containing the value F(L, R). Since those values can be very large, just output them modulo $2^{32}$

## Example

**Input:**

5

1 3

3 3

4 5

6 7

2 5

**Output:**

8

4

19