

2's complement



Understanding *2's complement* representation is fundamental to learning about Computer Science. Let's say you wrote down the **2's complement** for each **32-bit** integer in the inclusive range from **A** to **B**; how many **1's** would you write down in all?

Input Format

The first line contains **T**, the number of test cases.

The **T** subsequent lines each contain two space-separated integers, **A** and **B**, respectively.

Constraints

- $T \leq 1000$
- $-2^{31} \leq A \leq B \leq 2^{31} - 1$

Output Format

On a new line for each of the **T** test cases, print the number of **1's** in the **32-bit 2's complement** representation for integers in the inclusive range from **A** to **B**.

Sample Input

```
3
-2 0
-3 4
-1 4
```

Sample Output

```
63
99
37
```

Explanation

Test Case 0:

-2 contains **31** ones followed by a zero.

-1 contains **32** ones.

0 contains **0** ones.

31 + 32 + 0 = 63, so we print **63** on a new line.

Test Case 1:

31 + 31 + 32 + 0 + 1 + 1 + 2 + 1 = 99, so we print **99** on a new line.

Test Case 2:

32 + 0 + 1 + 1 + 2 + 1 = 37, so we print **37** on a new line.