Euler Totient Function Depth

Lucky is fond of Number theory, one day he was solving a problem related to Euler Totient Function (phi) and found an interesting property of phi : $phi(1) = 1$, and for $x > 1$: $phi(x) < x$. So if we define a sequence with $a_0 = x$, and for $n > 0$: $a_n = phi(a_{n-1})$, this sequence will be constant equal to 1 starting from some point. Lets define $depth(x)$ as minimal n such that $a_n = 1$. Now he is wondering how many numbers in a given range have depth equal to given number **k**. As you are a good programmer help Lucky with his task.

Input

Your input will consist of a single integer **T** followed by a newline and **T** test cases. Each test cases consists of a single line containing integers **m**, **n**, and **k**.

Output

Output for each test case one line containing the count of all numbers whose depth equals to **k** in given range [**m**, **n**].

Constraints

T < 10001
$1 \le m \le n \le 10^6$
$0 \le k < 20$

Example

Input:
5
1 3 1
1 10 2
1 10 3
1 100 3
1 1000000 17

Output:
1
3
5
8
287876

Explanation ::suppose number is 5 ; its depth will be 3. (5 -> 4 -> 2 -> 1)

Note ::Depth for 1 is 0.