# Problem N
## Trailing Zeros
### Time limit: 2 seconds



Image created using Google ImageFX

For a positive integer $n$ written in base $b$, a *trailing zero* is either a zero digit in the rightmost position, or a zero digit not in the rightmost position that is followed only by zero digits.

Let $z_b(n)$ be the number of trailing zeros in the base-$b$ representation of $n$. For example, if $n = 833$ and $b = 7$, then $z_b(n) = 2$, since the base-7 representation of 833 is 2300, which has 2 trailing zeros.

Given an interval $[\ell, r]$, find the sum of $z_b(n)$ over all $n \in [\ell, r]$.

## Input

The first line of input contains an integer $t$ $(1 \leq t \leq 120)$, the number of test cases. This is followed by $t$ lines, each of which contains a test case in the form of three integers, $b\ \ell\ r$, where $b$ $(2 \leq b \leq 16)$ is a base, and $\ell$ and $r$ $(1 \leq \ell \leq r \leq 10^{16})$ are left and right interval endpoints, respectively.

## Output

For each test case, output a line containing a single integer, the sum of $z_b(n)$ over all $n \in [\ell, r]$.

| Sample Input 1 | Sample Output 1 |
|---|---|
| 2<br>10 30 100<br>2 9 15 | 9<br>4 |

This page is intentionally left blank.