Problem E. Power of Function

Input file:	*standard input*
Output file:	*standard output*
Time limit:	4 seconds
Memory limit:	256 mebibytes

Bob has a function

$$f(n) = \begin{cases} \frac{n}{k} & \texttt{if } n \bmod k = 0 \\ n-1 & \texttt{otherwise} \end{cases},$$

which is defined for all **non-negative** integers.

Denote the m-th power of this function as $f^m(n)$ such that

$$f^m(n) = \begin{cases} f^{m-1}(f(n)) & \texttt{if } m > 0 \\ n & \texttt{otherwise} \end{cases}.$$

He would like to know the maximum possible integer m meeting the condition that there exists at least one integer n such that $l \le n \le r$ and $f^m(n) = 1$. Besides, please help him find out the minimum and the maximum n for the maximum possible m so that he could easily validate your answer is correct.

Input

The input contains several test cases. The first line contains an integer T indicating the number of test cases. The following describes all test cases. For each test case:

The only line contains three integers k, l, r.

- $1 \le T \le 3 \times 10^5$
- $2 \le k \le 10^{18}$
- $1 \le l \le r \le 10^{18}$
- It is guaranteed that solution exists for each test case.

Output

For each test case, output a line containing "`Case #x: m a b`" (without quotes), where `x` is the test case number starting from 1, `m` is the maximum possible exponent, `a` is the minimum possible argument, and `b` is the maximum possible argument with respect to `m`.

Example

standard input	standard output
5 2 1 1 2 1 2 2 1 4 2 998244353 998244354 10 998244353 998244354	Case #1: 0 1 1 Case #2: 1 2 2 Case #3: 2 3 4 Case #4: 35 998244353 998244354 Case #5: 55 998244354 998244354

Note

When $k = 2$, $\{f(n)\}_{n=0}^{\infty} = \{0, 0, 1, 2, 2, 4, 3, 6, 4, 8, \ldots\}$, and $\{f^2(n)\}_{n=0}^{\infty} = \{0, 0, 0, 1, 1, 2, 2, 3, 2, 4, \ldots\}$.