

Problem E. Easy Homework

Input file: *standard input*
Output file: *standard output*
Time limit: 1.5 seconds
Memory limit: 256 mebibytes

Let us fix an integer A . Consider a sequence $\{f(n)\}$ which satisfies the following two conditions:

1. $f(0) = 0, f(1) = 1$;
2. $f(n) = A \cdot f(n - 1) + f(n - 2)$ for any integer $n > 1$.

Given a prime p and an integer x ($0 \leq x < p$), your task is to calculate $|\{n : L \leq n \leq R, f(n) \bmod p = x\}|$, that is, the number of indices n between L and R such that $f(n) \bmod p = x$.

Input

There are one or more test cases.

The first line of input contains an integer T , the number of test cases ($1 \leq T \leq 42$).

Each of the next T lines contains five integers A, p, x, L and R ($0 \leq A < 10^9, 2 < p < 10^9, 0 \leq x < p, 1 \leq L \leq R \leq 10^{18}$). It is guaranteed that p is prime.

Output

Print T lines, one for each test case, containing the answers to the problem.

Example

standard input	standard output
2	1
1 5 0 1 5	2
2 29 12 3 6	