Permutation Equations



Let N be a positive integer. Let's define a mapping f on the set of permutations of integers from I to N, inclusive. Let X = (x[1], ..., x[N]) be a permutation of integers from I to N, inclusive. We define the permutation Y = (y[1], ..., y[N]) as follows.

- y[1] = 1.
- For i > 1 we consider number z = x[y[i-1]].
 - If z does not equal any of the numbers y[1], ..., y[i-1] then we set y[i] = z.
 - Otherwise y[i] is defined as the smallest integer from 1 to N (inclusive) that does not equal any of the numbers y[1], ..., y[i-1].

We consider permutation y as an image of x when mapping f is applied to x. That is, we set f(x) = y.

Denote by g(y) the number of solutions of the equation f(x) = y. That is, g(y) is the number of permutations x of integers from 1 to N, inclusive, such that f(x) = y.

Challenge

For the given non-negative integers L and R, find the number of permutations y of integers from 1 to N, inclusive, such that $L \le g(y) \le R$. Since this number can be quite large output it modulo $(10^9 + 7)$.

Input Format

The first line contains an integer T denoting the number of test cases. T test cases follow. Each test case consists of one line which contains three space-separated integers N, L and R.

Output Format

For each test case, output a single line containing P mod (10 $^9+7$), where P is the required number of permutations.

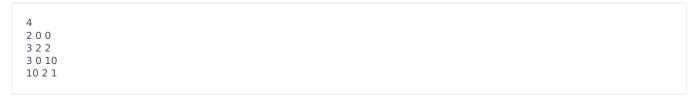
Constraints

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1 \le T \le 1000

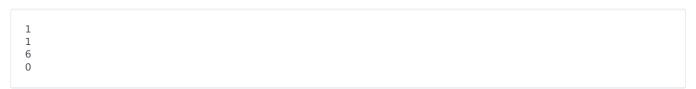
1 \le N \le 200,000

0 \le L, R \le 10^{18}
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Sample Input



Sample Output



Explanation

Example case 1. The only permutation y for which equation f(x) = y has no solutions is y = (2, 1).

Example case 2. The only permutation y for which equation f(x) = y has 2 solutions is y = (1, 3, 2). The solutions are x = (3, 2, 1) and x = (3, 1, 2).

Example case 3. For all 6 permutations y of numbers $\{1, 2, 3\}$ we have $0 \le g(y) \le 10$.

Example case 4. Be careful, *L* could be greater than *R*. In this case the answer is zero.