

Problem I. Interesting Permutations

Input file: *standard input*
Output file: *standard output*
Time limit: 6 seconds
Memory limit: 1024 mebibytes

A permutation $p = (p_1, p_2, \dots, p_{10^5})$ of length 10^5 is considered *interesting* if it may be constructed in the following way.

- Consider points $1, 2, \dots, 10^5$ arranged along the coordinate line.
- Choose one of those points as the current point.
- There is a sequence p that is initially empty.
- Repeat the following operation until the length of p is 10^5 : let x be the number corresponding to the current point. If x is not in p , add x to the end of p . Then move to one of the points whose distance to x is less than or equal to k .

The distance between points i and j is $|i - j|$.

Your task is to answer the queries of the following form. You are given three integers: n , ℓ , and r . We can pick any interesting permutation p , and then construct $s = (s_1, s_2, \dots, s_n)$: the permutation created by removing elements larger than n from p . Among the possible s , find the number of permutations such that $\ell \leq s_1 \leq r$.

Since the number of such permutations may be too large, print it modulo 998 244 353.

Input

The first line of input contains two integers, k and q : the maximum distance and the number of queries, respectively ($1 \leq k \leq 10^5$; $2 \leq q \leq 2 \cdot 10^5$). Each of the following q lines contains one query: three integers n , ℓ , and r ($1 \leq n \leq 10^5$; $1 \leq \ell \leq r \leq n$).

Output

Output q lines. On the i -th of these lines, print the answer to the i -th query.

Examples

<i>standard input</i>	<i>standard output</i>
2 4 4 1 3 3 1 1 9 3 7 1 1 1	16 2 27160 1
256 2 3 1 2 65536 1024 32768	4 517264494