

Problem I. Distance Permutation

- Time Limit: 5 sec

Problem Statement

You construct a permutation $P = (P_1, P_2, \dots, P_{10^5})$ of length 10^5 in the following way.

The number line has points $1, 2, \dots, 10^5$. The distance between points i and j is $|i - j|$. Also, there is a sequence P that is initially empty. Repeat the following operations from any point 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 . Next, move to one of the points whose distance is less than or equal to K .

Answer the following Q queries.

- You are given integers N, L, R . Let the sequence created by removing elements larger than N from P be $P' = (P'_1, P'_2, \dots, P'_N)$. Among the possible permutations of P' , answer the number of permutations in which P'_1 is greater than or equal to L and less than or equal to R with mod 998244353.

Input

K Q
query₁
⋮
query _{Q}

query _{i} represents the i -th query.

Each query is given in the following format.

N L R

The input satisfies the following constraints.

- All inputs consist of integers.
- $1 \leq Q \leq 2 \times 10^5$
- $1 \leq K \leq 10^5$
- $1 \leq N \leq 10^5$
- $1 \leq L \leq R \leq N$

Output

Output Q lines. On the i -th line, output the answer of the i -th query.

| Sample Input 1 | Sample Output 1 |
|---|--|
| 2 4 4 1 1 3 1 3 10 2 7 1 1 1 | 4 6 140172 1 |
| Sample Input 2 | Sample Output 2 |
| 314 6 60522 7560 25373 79445 26896 78962 33447 12441 21469 47202 17227 32455 63982 13450 41311 2156 1226 2148 | 925500464 455690352 567782656 893053639 942918900 458845228 |

In Sample Input 1, There are four possible sequences as P' in the first query.

- (1, 2, 3, 4)
- (1, 2, 4, 3)
- (1, 3, 2, 4)

- $(1, 3, 4, 2)$