

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
⋮
queryQ
```

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)