

## PROBLEM 2 – Kangaroo

DAY 1 TASK 2  
ENGLISH



A garden is composed of a row of  $N$  cells numbered from 1 to  $N$ . Initially, all cells contain plants. A kangaroo arrived in the garden in cell numbered  $cs$ . Then he jumps from cell to cell, eating the plants as he goes. He will always finish in cell numbered  $cf$ , after visiting each of the  $N$  cells exactly once, including  $cs$  and  $cf$ . Obviously, the kangaroo will make  $N-1$  jumps.

The kangaroo doesn't want to be caught, so after each jump he changes the direction in which he jumps next: if he is currently in cell numbered  $current$  after he jumped there from a cell numbered  $prev$ , and will jump from  $current$  to cell numbered  $next$ , then:

- if  $prev < current$ , then  $next < current$ ; else,
- if  $current < prev$ , then  $current < next$ .

Knowing the number  $N$  of cells in the garden, the starting cell  $cs$  from where the kangaroo starts to eat plants and the final cell  $cf$  where the kangaroo finishes, you should calculate the number of distinct routes the kangaroo can take while jumping through the garden.

### Input format

The input file `kangaroo.in` will contain three space separated positive integers  $N$ ,  $cs$ ,  $cf$ .

### Output format

In the output file `kangaroo.out` you should write a single integer, the number of distinct routes the kangaroo can take modulo  $1000000007$  ( $10^9 + 7$ ).

### Notes and constraints

- $2 \leq N \leq 2000$
- $1 \leq cs \leq N$
- $1 \leq cf \leq N$
- $cs \neq cf$
- For tests worth 6 points,  $N \leq 8$ .
- For tests worth 36 points,  $N \leq 40$ .
- For tests worth 51 points,  $N \leq 200$ .
- Any route is uniquely determined by the order in which cells are visited.
- We guarantee that for each test there is at least one route which follow the rules.
- The kangaroo can start jumping in any direction from  $cs$ .

### Example

kangaroo.in	kangaroo.out	Note
4 2 3	2	The kangaroo starts from cell 2 and finishes in cell 3. The two correct routes are 2 -> 1 -> 4 -> 3 and 2 -> 4 -> 1 -> 3