

## D. Flowers

time limit per test: 1.5 seconds  
 memory limit per test: 256 megabytes  
 input: standard input  
 output: standard output

We saw the little game Marmot made for Mole's lunch. Now it's Marmot's dinner time and, as we all know, Marmot eats flowers. At every dinner he eats some red and white flowers. Therefore a dinner can be represented as a sequence of several flowers, some of them white and some of them red.

But, for a dinner to be tasty, there is a rule: Marmot wants to eat white flowers only in groups of size  $k$ .

Now Marmot wonders in how many ways he can eat between  $a$  and  $b$  flowers. As the number of ways could be very large, print it modulo  $1000000007$  ( $10^9 + 7$ ).

### Input

Input contains several test cases.

The first line contains two integers  $t$  and  $k$  ( $1 \leq t, k \leq 10^5$ ), where  $t$  represents the number of test cases.

The next  $t$  lines contain two integers  $a_i$  and  $b_i$  ( $1 \leq a_i \leq b_i \leq 10^5$ ), describing the  $i$ -th test.

### Output

Print  $t$  lines to the standard output. The  $i$ -th line should contain the number of ways in which Marmot can eat between  $a_i$  and  $b_i$  flowers at dinner modulo  $1000000007$  ( $10^9 + 7$ ).

### Examples

input
3 2
1 3
2 3
4 4
output
6
5
5

### Note

- For  $K = 2$  and length 1 Marmot can eat ( $R$ ).
- For  $K = 2$  and length 2 Marmot can eat ( $RR$ ) and ( $WW$ ).
- For  $K = 2$  and length 3 Marmot can eat ( $RRR$ ), ( $RWW$ ) and ( $WWR$ ).
- For  $K = 2$  and length 4 Marmot can eat, for example, ( $WWWW$ ) or ( $RWWR$ ), but for example he can't eat ( $WWWR$ ).

### Codeforces Round #271 (Div. 2)

Finished

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Start virtual contest

#### → Problem tags

dp

No tag edit access

#### → Contest materials

- Announcement 
- Tutorial 