



The Grade

Maximum time of execution: 0.5seconds/test.
Maximum available memory: 512 MB

AlekuKebap is in his math class. While he tries to figure out why $1+1=2$, his teacher was writing on the board a slightly more complicated problem. There are given Q queries and a list S with P elements equal with 0. Let A be initially an empty set. The queries can be:

- 0 x (insert value x in set A)
- 1 x (erase the value x from set A , it is guaranteed that the value x exists in set A)

It is guaranteed that A will never be empty after a query. After every query, the teacher asks Aleku the following question: can I arrange in list S all elements from the set A (not necessary in the order from the A) so that:

- Elements from A will be put on distinct positions, the rest being occupied by P elements equal with 0
- Let $S[i]$ be a positive element from S and $S[j]$ the closest positive element from S that is located to the left of $S[i]$, then the following condition must be respected: $i-j \geq S[i]$.
- Let f be the first positive element from the left of S , then $f \geq S[f]$.

If the answer to this question is yes, then find how many different configurations can be obtained. Because the answer can be very big, print the answer **modulo 1.000.000.007**. If the answer is no, print -1.

TASK

Help AlekuKebap to answer correctly to all teacher's questions to receive a 10 grade.
HIS AVERAGE DEPENDS ON THIS GRADE!!

INPUT FORMAT

The first line contains two integers Q and P .
The next Q lines contain the description of every query.

OUTPUT FORMAT

Every line will contain the answer to every question from the Q questions.

SUBTASKS

- **YOU HAVE TO PRINT THE ANSWER MODULO 1.000.000.007.**
- **All numbers that will be added in the set are $\leq 1.000.000$.**
- **WARNING!!! If the answer for a query is no, print -1 !!!**
- **WARNING !!! Alecu is not a kebab, he is a human being but this is his name. He is actually a captain...THE CAPTAIN.**

Subtask	Score	Restrictions
1	10 points	$Q \leq 22, P \leq 22$
2	Another 10 points	$Q \leq 100.000, P \leq 3000$ and all the values that will be at the same time in A will be equal
3	Another 10 points	$Q \leq 100.000, P \leq 3000$ and all the values that will be at the same time in A will be different
4	Another 20 points	$Q \leq 100.000, P \leq 3000$
5	Another 15 points	$Q \leq 100.000, P \leq 100.000$ and all the values that will be at the same time in A will be equal
6	Another 15 points	$Q \leq 100.000, P \leq 100.000$ and all the values that will be at the same time in A will be different
7	Another 20 points	$Q \leq 100.000, P \leq 100.000$

EXAMPLE:

Input:

9 8
0 3
0 3
0 2
1 2
0 1
0 1
0 1
1 3
1 1



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Output:

6
6
3
6
12
6
-1
60
60