



Haunted

Max. Score 100

The king of ghosts is really disappointed when he sees that all the human beings on Planet Earth have stopped fearing the ghost race. He knows the reason for this. The existing ghost race has become really lazy and has stopped visiting Planet Earth to scare the human race. Hence, he decides to encourage the entire ghost race into scaring the humans by holding a competition. The king, however, never visits Planet Earth.

This competition will go on for **N days**. Currently, there are a total of **M ghosts** (apart from the king) existing in the ghost race such that :  
- **The youngest ghost is 1 year old.**  
- **The oldest ghost is M years old.**  
- **No two ghosts have the same age.**  
- **The age of each and every ghost is a positive integer.**

On each day of the competition, ghosts have to visit Planet Earth to scare people. At the end of each day, a **"Ghost of the Day" title** is awarded to the ghost who scares the most number of humans on that particular day. However, the king of ghosts believes in consistency. Once this title has been given, the ghost who has won the most number of such titles until that particular moment is presented with a **"Consistency Trophy"**. If there are many such ghosts, the **oldest** among them is given the trophy. Note that this "Title Giving" and "Trophy Giving" happens at the end of each day of the competition.

You will be given the age of the ghost who won the **"Ghost of the Day" title** on each day of the competition. Your job is to find out the age of the ghost who was awarded with the **"Consistency Trophy"** on each day of the competition.

**Input**  
The first line consists of 2 space separated integers **N** and **M**. The next line consists of **N** space separated integers such that the **i**th integer denotes the age of the ghost who was awarded with the **"Ghost of the Day" title** on the **i**th day of the competition.

**Output**  
Print **N** lines. The **i**th line should contain 2 space separated integers such that the first integer denotes the **age of the ghost** who was awarded with the **"Consistency Trophy"** on the **i**th day and the second integer denotes the number of **"Ghost of the Day" titles** won by this ghost until the end of the **i**th day of the competition.

**Constraints**  
1 ≤ **N** ≤ 105  
1 ≤ **M** ≤ 109

Sample Input [(Plaintext Link)](https://he-s3.s3.amazonaws.com/media/hackathon/taxiforsure-hiring-challenge/problems/haunted/sample-input-9977c6a.txt?Signature=1SeLFP7jEAuMP0qg%2Fw%2FvVFUWGvg%3D&Expires=1417368498&AWSAccessKeyId=AKIAJLE6MUHDYS3HN6YQ)

7 5  
1 3 1 3 2 2 2

Sample Output [(Plaintext Link)](https://he-s3.s3.amazonaws.com/media/hackathon/taxiforsure-hiring-challenge/problems/haunted/sample-output-9986ff5.txt?Signature=%2BZsKoCzk6d2%2FFt0B%2BnihXEkwmAA%3D&Expires=1417368498&AWSAccessKeyId=AKIAJLE6MUHDYS3HN6YQ)

1 1  
3 1  
1 2  
3 2  
3 2  
3 2  
2 3

Dexter and Mandark

Max. Score 100

Dexter and Mandark are playing a game. The game consists of **N** rounds. After each round, the winner (either Dexter or Mandark) will be awarded one point. The player with **more points** at the end of the game wins.

Mandark is Dexter's arch enemy. Dexter wants to prove that he is superior to Mandark.  
He wants that after each round in the game he has atleast **M** times the points that Mandark has.  
Dexter is busy planning his game strategy so he asks you to tell him the number of ways he can win the game with the condition just described.

Two ways of winning the game are said to be different if some round is won by a different person.

**Input:**  
The first line contains T, the number of test cases.  
Each test case consists of a single line with two space separated integers N and M.

**Output:**  
For each test case, output the answer modulo 10^9 + 7

**Constraints:**

1<=T<=10  
1<=M<=N<=1000

Sample Input [(Plaintext Link)](https://he-s3.s3.amazonaws.com/media/hackathon/taxiforsure-hiring-challenge/problems/dexter-and-mandark-1/sample-input-2a8b382.txt?Signature=xKryM8xSihCEecop8Su5pzpc4gg%3D&Expires=1417368532&AWSAccessKeyId=AKIAJLE6MUHDYS3HN6YQ)

2  
3 1  
3 3

Sample Output [(Plaintext Link)](https://he-s3.s3.amazonaws.com/media/hackathon/taxiforsure-hiring-challenge/problems/dexter-and-mandark-1/sample-output-2a99aa4.txt?Signature=6Hav2h6Bk6CI%2FmlA3%2FPzcU3OfrA%3D&Expires=1417368532&AWSAccessKeyId=AKIAJLE6MUHDYS3HN6YQ)

3  
1

Explanation

For the first test case, the possible sequence of winners of rounds are:  
DDD  
DMD  
DDM  
  
( MDD is not possible because in that sequence, even though Dexter wins in the end, but after first round Dexter does not have atleast M times the points that Mandark has)  
  
For the second test case, the only possible sequence is :  
DDD  
  
[D=Dexter, M=Mandark]

Time Limit: 1 sec(s) for each input file.

Memory Limit: 256 MB

Source Limit: 1024 KB

Scoring: Score is assigned in case any testcase passes.