

Problem J: Just Believe in Binary Search

- Time Limit: 4 sec

Problem Statement

Alice, who was exploring ruins in search of treasure, arrived at a corridor where the entrances to N rooms were lined up in a row. Upon investigation, she found that the rooms were numbered uniquely from 1 to N , but the exact number of each room was unknown until she entered. She discovered that the treasure was hidden in room K .

Given her remaining stamina, it was difficult for Alice to check all the rooms. However, Alice had a secret strategy to overcome this situation: binary search. Alice had successfully applied binary search to various challenges before. With her last ounce of strength, she decided to use binary search to find room K .

Specifically, she followed these steps:

- Initialize variables l and r with $l = 0$ and $r = N + 1$.
- Repeat steps 1 to 3 as follows:
 1. If $l + 1 = r$, stop the operation as she has not found room K .
 2. Set $m = \lfloor \frac{l+r}{2} \rfloor$. Enter the room positioned m -th from the left, check its number, and let this number be x .
 3. If $x = K$, stop the operation as she has found room K . If $x < K$, update l to m . If $x > K$, update r to m .

There are $N!$ possible mappings between rooms and numbers. You need to determine the number of mappings for which Alice can successfully find room K using the above procedure, modulo **998,244,353**.

Given T test cases, compute the answer for each.

Input

The input is given in the following format:

```
 $T$   
case1  
case2  
⋮  
case $T$ 
```

Here, **case** _{i} denotes the i -th test case.

Each test case is given in the following format:

```
 $N$   $K$   
  
•  $1 \leq T \leq 100,000$   
•  $3 \leq N \leq 10^6$   
•  $1 \leq K \leq N$   
• All input values are integers.
```

Output

Output T lines. On the i -th line, output the answer for the i -th test case.

Sample Input	Sample Output
5	4
3 1	12
4 2	66
5 4	1192320
10 5	853363991
1000000 314159	