

Problem J. Jungle and Pyramid

Input file: *standard input*
Output file: *standard output*
Time limit: 4 seconds
Memory limit: 1024 mebibytes

Alice, who was exploring mystical buildings in the jungle in search of treasure, found a pyramid built by Mayan priests. Alice entered it and found herself in 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 also 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, Alice proceeds as follows. First, she initializes variables ℓ and r with $\ell = 0$ and $r = n + 1$. Then she repeats steps 1 to 3 as follows:

1. If $\ell + 1 = r$, stop the search as she has not found room k .
2. Set $m = \lfloor (\ell + r) / 2 \rfloor$.
Enter the room positioned m -th from the left, check its number, and let this number be x .
3. If $x = k$, stop the search 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 first line of the input contains a single integer t , the number of test cases ($1 \leq t \leq 10^5$). Then t test cases follow.

Each test case consists of a single line containing two integers n and k ($3 \leq n \leq 10^6$, $1 \leq k \leq n$).

Output

For each test case, print a single integer: the answer to the problem.

Example

<i>standard input</i>	<i>standard output</i>
5	4
3 1	12
4 2	66
5 4	1192320
10 5	853363991
1000000 314159	