Problem B – Box delivery

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Jaime has a box transportation company and recently has been hired by a factory that needs K boxes to be moved to their new branch.

Jaime charges based on the number of trips N he does to deliver all the boxes. This charging schema allows Jaime to do some trips without carrying boxes, this way he can earn more money, but he can't do this all the time since eventually all the boxes should be delivered at the end of its N-th trip. The company that hired him is very serious and seems suspicious that Jaime charges by trip instead of by box delivered, that's why they have assigned a supervisor that will oversee Jaime's trips.

There are some days that the supervisor will be waiting for Jaime in the new branch to verify that he is bringing boxes, these days Jaime can't come without boxes to deliver. The worst is that some days the boss of the assigned supervisor will come to check the deliveries. He does not want Jaime to bring less than two boxes these days. If the supervisor or his boss find Jaime with less boxes than they expected in the branch in a given day, then Jaime risks his contract to be resigned.

Jaime has signed a contract where he states he will be doing one trip per day, also he already knows the days the supervisor will be in the new branch and the days the supervisors boss will be in the branch. Jaime is wondering in how many ways he can deliver the boxes without the risk that the supervisor or his boss resign his contract. Two delivery schedules differ if they differ on the number of boxes delivered in any given day.

Input

The first line of input contains a single integer T ($1 \leq T \leq 1000$), representing the number of test cases. Each of the following test cases start with a line with two numbers separated by a space N and K, ($1 \leq N, K \leq 10^5$) representing the number of days Jaime will do trips to the new branch and the number of boxes he needs to deliver. The next line contains integer numbers separated by space representing the days the supervisor will be in the new branch waiting for Jaime to deliver boxes, the last line contains integer numbers separated by space representing the days the supervisors boss will be in the new branch waiting for Jaime to deliver boxes. All days are in the range $[1, N]$

Output

For each test case in the input, output a line containing the number of ways Jaime can schedule the trips. As the answer can be very big, print it modulo 986444689.

Sample input 1	**Sample output 1**
1 3 3 1 2	1