

## Problem A. Sum of Product of Binomial Coefficients

- Time Limit: 2 sec

### Problem Statement

You are given integers  $N$  and  $K$ . For a positive integer  $k$ ,  $f(k)$  is defined as follows.

- The sum of  $\binom{N}{a_1} \times \binom{a_1}{a_2} \times \dots \times \binom{a_{k-1}}{a_k}$  for all integer sequences  $(a_1, a_2, \dots, a_k)$  that satisfy the condition  $N \geq a_1 \geq a_2 \geq \dots \geq a_k \geq 0$ .

Answer the remainder of  $\sum_{k=1}^K f(k)$  divided by 998244353.

For each input, solve  $T$  test cases.

Note that  $\binom{A}{B}$  represents "the number of ways to select  $B$  distinct items from  $A$  items" (i.e., the binomial coefficient).

### Input

```
T
case1
⋮
caseT
```

Each test case is given in the following format.

```
N K
```

The input satisfies the following constraints.

- All test cases consist of integers.
- $1 \leq T \leq 10^5$
- $0 \leq N \leq 10^9$
- $1 \leq K \leq 2 \times 10^5$
- The sum of  $K$  in one test case does not exceed  $2 \times 10^5$ .

### Output

Output the remainder of  $\sum_{k=1}^K f(k)$  divided by 998244353 for each test case.

Sample Input	Sample Output
3 3 3 0 1 31415 92653	99 1 276482222