

## Problem G. Sequence Domination

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            **3 seconds**  
Memory limit:         **1024 megabytes**

An integer sequence  $V_1, V_2, \dots, V_N$  is called **super decreasing** if  $V_N \geq 0$ , and  $V_i \geq V_{i+1} + V_{i+2} + \dots + V_N$  for all  $1 \leq i < N$ .

Given positive integers  $N$  and  $M$ , find the number of pairs of integer sequences  $A$  and  $B$  of length  $N$  such that  $1 \leq A_i, B_i \leq M$  for all  $1 \leq i \leq N$ , and for all super decreasing sequences  $V$  of length  $N$ ,

$$\sum_{i=1}^N A_i V_i \geq \sum_{i=1}^N B_i V_i.$$

Since the number of such pairs can be very large, print the answer modulo 998 244 353.

### Input

The input is given in the following format:

$T$
$N \ M$
$\vdots$

- All input values are integers.
- $1 \leq T \leq 100$
- $1 \leq N, M \leq 5000$
- It is guaranteed that the sum of  $N$  over all test cases does not exceed 5000.
- It is guaranteed that the sum of  $M$  over all test cases does not exceed 5000.

### Output

For each test case, output a single integer — the number of pairs of sequences  $(A, B)$  satisfying the conditions, modulo 998 244 353.

### Examples

standard input	standard output
4	1
1 1	10
2 2	1
2 1	711021868
34 43	

### Note

**Test case 1:** The only possible pair of sequences is  $([1], [1])$ , and it is valid.

**Test case 2:** The following are valid pairs of sequences:

- For  $B = [1, 1]$ , any choice of  $A$  is valid. There are four possible choices.
- For  $B = [1, 2]$ , valid choices of  $A$  are  $[1, 2]$ ,  $[2, 1]$ ,  $[2, 2]$ .
- For  $B = [2, 1]$ , valid choices of  $A$  are  $[2, 1]$ ,  $[2, 2]$ .

- For  $B = [2, 2]$ , the only valid choice of  $A$  is  $[2, 2]$ .

So, the number of valid pairs of sequences equals  $4 + 3 + 2 + 1 = 10$ .