

IOI Training Camp 2018 Practice Test 2

Special Sequences

Let us call a sequence of positive integers a_1, a_2, \dots, a_n special if there exists some k ($1 \leq k \leq n$), such that the sequence a_1, a_2, \dots, a_k is non-decreasing and the sequence a_k, a_{k+1}, \dots, a_n is non-increasing.

Given integers n and m , find the number of sequences such that:

- the length of the sequence is n
- all elements of the sequence are positive integers (non-zero) not greater than m
- the sequence is special

Since the answer could be quite large, output it modulo $10^9 + 7$.

Note: A sequence is non-decreasing if every element in it is greater than or equal to the previous one. A sequence is non-increasing if every element in it is less than or equal to the previous one.

Input

The input has one line, containing n and m .

Output

Output a single integer, the required answer.

Subtasks

Subtask 1 (30 Points):

- $1 \leq n \leq 1000$
- $1 \leq m \leq 100$

Subtask 2 (70 Points):

- $1 \leq n \leq 5000$
- $1 \leq m \leq 5000$

Sample Input 1

2 3

Sample Output 1

9

Explanation 1

There are 9 possible sequences of length 2 using the numbers 1, 2, 3. All 9 of them are special.

Sample Input 2

3 3

Sample Output 2

22

Explanation 2

There are 27 possible sequences of length 3 using the numbers 1, 2, 3. All of them are special except for these 5:

- 2 1 2
- 2 1 3
- 3 1 2
- 3 1 3
- 3 2 3

Limits

Time: 5 seconds

Memory: 256 MB