Problem G. Generate the Sequences

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

Consider S, the sequence of integer sequences. Initially, $S_0 = (1)$. After that, we construct $S_1, S_2, \ldots, S_n$ as follows.

Let $|S_i|$ be the length of the sequence S_i, and $s_{i,j}$ be the j-th element of S_i. Then S_{i+1} will have length $|S_i| + 1$ and can be obtained from $|S_i|$ using one of the following two operations:

- Write 1 or the given integer m as the element with number $|S_i| + 1$ of the new sequence.
- Select an index j ($1 \le j < |S_i|$), choose integer x such that $s_{i,j} < x < s_{i,j+1}$ or $s_{i,j} > x > s_{i,j+1}$, and place it between $s_{i,j}$ and $s_{i,j+1}$, shifting the right part's indices by 1.

Given n and m, find the number of different ordered sets of sequences $S_1 \ldots S_n$. Two sets are considered different if, at least for one i from 1 to n, the sequences S_i in those sets differ. As the answer may be too large, print it modulo 998 244 353.

Input

The input consists of one line containing two integers n and m ($1 \le n \le 3000$, $2 \le m \le 10^8$).

Output

Print the number of different sequences S modulo 998 244 353.

Examples

standard input	standard output
2 3	5
1024 52689658	654836147

Note

Here are the possible sequences in the first example:

- $S_1 = (1, 3)$ (first operation), then $S_2 = (1, 2, 3)$ (second operation);
- $S_1 = (1, 1)$ (first operation), then $S_2 = (1, 1, 3)$ (first operation);
- $S_1 = (1, 1)$ (first operation), then $S_2 = (1, 1, 1)$ (first operation);
- $S_1 = (1, 3)$ (first operation), then $S_2 = (1, 3, 3)$ (first operation);
- $S_1 = (1, 3)$ (first operation), then $S_2 = (1, 3, 1)$ (first operation).

Therefore, the answer is 5.