Automata Embedding

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	1024 mebibytes

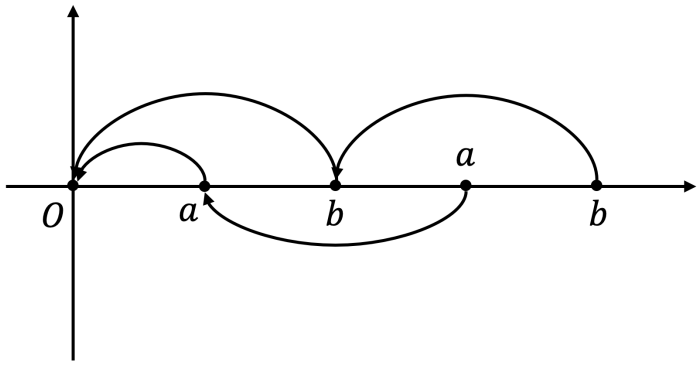
For a string S of length n, let $S[a..b]$ denote the substring consisting of the characters from position a to position b (where $1 \leq a \leq b \leq n$). Also, the failure function $f : [0, n] \to [0, n-1]$ of S is defined as follows.

$$f(i) = \max(\{0\} \cup \{j \mid S[1..j] = S[i-j+1..i],\ 1 \leq j < i\})$$

The **KMP automaton** made using the failure function of string S denotes the following kind of automaton. The automaton has $n+1$ **states** $[0..n]$, and for each state $0 \leq i \leq n$, there exists exactly one **transition** from i to $f(i)$.

If a KMP automaton can be embedded on a plane, it means that if we map state i to a point at $(i, 0)$ on the plane, and draw all transitions $i \to f(i)$ as arrows which do **not** cross the x-axis on the plane, it is possible to draw all $n+1$ arrows such that no arrows intersect except when they meet at endpoints.

Using an alphabet consisting of C letters, find the number of strings of length n whose KMP automaton can be embedded on a plane modulo 998 244 353.



KMP automaton for the string $S =$ `abab`

Input

The first line of input contains two space-separated integers n and C, denoting the length of the string and the number of letters in the alphabet respectively.

Output

The first line of output should contain the number of strings of length n whose KMP automaton can be embedded on a plane modulo 998 244 353.

Scoring

- $1 \leq n \leq 10^{18}$
- $1 \leq C \leq 10^9$

Examples

standard input	standard output
3 3	27
1000000000000000000 1000000000	609226805