Problem B. Tree

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

We generate two rooted trees with n vertices in the following way.

The first tree is generated as follows:

1. Vertex 1 is the root of the tree.

2. For all $i \in [2, n]$, we select one vertex from $[1, i - 1]$ as the father of i.

The second tree is generated as follows:

1. Vertex n is the root of the tree.

2. For all $i \in [1, n - 1]$, we select one vertex from $[i + 1, n]$ as the father of i.

A way to generate the trees is *good* if and only if every vertex i which is a leaf in tree 1 is not a leaf in tree 2, and every vertex i which is not a leaf in tree 1 is a leaf in tree 2. The root of every tree is not a leaf, regardless of the number of adjacent edges.

Now for all $n \in [2, N]$, calculate the number of good ways to generate trees. Two ways are considered different if and only if there exists a vertex i such that the parent of i in at least one tree is different in these two ways. You should output the answer modulo M.

Input

The first line of input contains two integers N and M ($2 \le N \le 500$, $10 \le M \le 2^{30}$).

Output

Output $N - 1$ lines: the answers for $n = 2, 3, \ldots, N$.

Example

standard input	standard output
5 998244353	1 2 12 120