Problem E. U Cluj

Input file	stdin
Output file	stdout

RANDy sold U Cluj for their terrible performance last season. Now, with the money in his pocket, he's looking for his next business opportunity. After hearing about the prestigious fireman olympiad, he had a marvelous idea: a fireman department business.

You are very eager to become a fireman, so you go to an interview and got the following question:

You are given an integer N and an integer P. For every K from 1 to P, compute the number of ways you can write N as a sum of K numbers which can be written as $2^x - 1$ for some integer $x \geq 1$, modulo $10^9 + 7$.

RANDy promises you that if you solve this problem, he will give you his best hose and put it on your shoulder, thus making you the most prolific fireman the world has ever seen. You can be sure you'll get the gold medal at the fireman olympics!

Input Data

The first line of the input contains two integers N and P.

Output Data

The first line of the output contains P integers, separated by spaces. The K^{th} integer represents the number of ways you can write N as a sum of K numbers which can be written as $2^x - 1$ for some integer $x \geq 1$, modulo $10^9 + 7$.

Restrictions

- $1 \leq N \leq 10^{18}$
- $1 \leq P \leq 1000$

Examples

Input file	Output file	Explanations
4 2	0 1	• For $K = 1$, there is no valid decomposition. • For $K = 2$, $4 = 3 + 1$.
14 4	0 1 0 1	• $K = 2$: $14 = 7 + 7$. • $K = 4$: $14 = 7 + 3 + 3 + 1$.
9 3	0 0 2	• $K = 3$: $9 = 3 + 3 + 3$, and $9 = 7 + 1 + 1$.