Problem U Cluj

Input file	`stdin`
Output file	`stdout`

After RANDy sold U Cluj for their terrible performance last season, he is now wondering what to invest the money into. 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, and you can be sure you'll get the gold medal at the fireman olympics!

Input

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

Input

The first line of the output contains P integers, separated by spaces. The Kth 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

- $1 \leq N \leq 10^{18}$.
- $1 \leq P \leq 500$.

#	Points	Restrictions
1	7	$1 \leq N \leq 500, 1 \leq P \leq 15$
2	14	$1 \leq N \leq 50000, 1 \leq P \leq 50$
3	28	$1 \leq P \leq 50$
4	22	$1 \leq P \leq 150$
5	29	No additional constraints.

Examples

Input file	Output file	Explanations
4 2	0 1	For $K = 1$, there exists no solution. For $K = 2$, $4 = 3 + 1$.
14 4	0 1 0 1	For $K = 1$, there exists no solution. For $K = 2$, $14 = 7 + 7$. For $K = 3$, there exists no solution. For $K = 4$, $14 = 7 + 3 + 3 + 1$.
9 3	0 0 2	For $K = 1$, there exists no solution. For $K = 2$, there exists no solution. For $K = 3$, $9 = 3 + 3 + 3$ and $9 = 7 + 1 + 1$.