E. Team Work

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You have a team of N people. For a particular task, you can pick any non-empty subset of people. The cost of having x people for the task is x^k.

Output the sum of costs over all non-empty subsets of people.

Input

Only line of input contains two integers N $(1 \leq N \leq 10^9)$ representing total number of people and k $(1 \leq k \leq 5000)$.

Output

Output the sum of costs for all non empty subsets modulo $10^9 + 7$.

Examples

input
1 1

output
1

input
3 2

output
24

Note

In the first example, there is only one non-empty subset $\{1\}$ with cost $1^1 = 1$.

In the second example, there are seven non-empty subsets.

- $\{1\}$ with cost $1^2 = 1$

- $\{2\}$ with cost $1^2 = 1$

- $\{1, 2\}$ with cost $2^2 = 4$

- $\{3\}$ with cost $1^2 = 1$

- $\{1, 3\}$ with cost $2^2 = 4$

- $\{2, 3\}$ with cost $2^2 = 4$

- $\{1, 2, 3\}$ with cost $3^2 = 9$

The total cost is $1 + 1 + 4 + 1 + 4 + 4 + 9 = 24$.