Sum of max of iai

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	1024 megabytes

You are given a positive integer N and a prime number P.

For a permutation $(a_1, a_2, \cdots, a_N)$ of $1, 2, \cdots, N$, define its **score** $f(a)$ as follows.

$$f(a) = \max\{ia_i \mid i = 1, 2, \cdots, N\}$$

Find the remainder when the sum of the scores over all permutations is divided by P.

Input

The first line contains N, P in this order, separated by spaces. ($1 \leq N \leq 10^4, 10^8 \leq P < 10^9, P$ is prime)

Output

Print the remainder when the sum of the scores over all permutations is divided by P.

Examples

standard input	standard output
10 100000007	77379290
1000 998244353	168695631

Note

For the first example, for instance, $f(3, 9, 4, 10, 8, 2, 7, 5, 6, 1) = 54$.

The sum of the scores over all 10! permutations is 277379304, and the remainder when this is divided by the prime $P = 10^8 + 7$ is 77379290, so print 77379290. **Note that for this input, the prime number P is the 9-digit integer $10^8 + 7$.**