E. Anniversary

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

There are less than 60 years left till the 900-th birthday anniversary of a famous Italian mathematician Leonardo Fibonacci. Of course, such important anniversary needs much preparations.

Dima is sure that it'll be great to learn to solve the following problem by the Big Day: You're given a set A, consisting of numbers $l, l+1, l+2, ..., r$; let's consider all its k-element subsets; for each such subset let's find the largest common divisor of Fibonacci numbers with indexes, determined by the subset elements. Among all found common divisors, Dima is interested in the largest one.

Dima asked to remind you that Fibonacci numbers are elements of a numeric sequence, where $F_1 = 1, F_2 = 1, F_n = F_{n-1} + F_{n-2}$ for $n \geq 3$.

Dima has more than half a century ahead to solve the given task, but you only have two hours. Count the residue from dividing the sought largest common divisor by m.

Input

The first line contains four space-separated integers m, l, r and k $(1 \leq m \leq 10^9; 1 \leq l < r \leq 10^{12}; 2 \leq k \leq r - l + 1)$.

Please, do not use the `%lld` specifier to read or write 64-bit integers in C++. It is preferred to use `cin`, `cout` streams or the `%I64d` specifier.

Output

Print a single integer — the residue from dividing the sought greatest common divisor by m.

Examples

input
10 1 8 2
output
3

input
10 1 8 3
output
1