B. The Golden Age

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Unlucky year in Berland is such a year that its number n can be represented as $n = x^a + y^b$, where a and b are non-negative integer numbers.

For example, if $x = 2$ and $y = 3$ then the years `4` and `17` are *unlucky* ($4 = 2^0 + 3^1$, $17 = 2^3 + 3^2 = 2^4 + 3^0$) and year `18` isn't *unlucky* as there is no such representation for it.

Such interval of years that there are no *unlucky* years in it is called *The Golden Age* .

You should write a program which will find maximum length of *The Golden Age* which starts no earlier than the year l and ends no later than the year r. If all years in the interval $[l, r]$ are *unlucky* then the answer is `0`.

Input

The first line contains four integer numbers x, y, l and r ($2 \le x, y \le 10^{18}$, $1 \le l \le r \le 10^{18}$).

Output

Print the maximum length of *The Golden Age* within the interval $[l, r]$.

If all years in the interval $[l, r]$ are *unlucky* then print `0`.

Examples

input
2 3 1 10
output
1

input
3 5 10 22
output
8

input
2 3 3 5
output
0

Note

In the first example the *unlucky* years are `2, 3, 4, 5, 7, 9` and `10`. So maximum length of *The Golden Age* is achived in the intervals $[1, 1]$, $[6, 6]$ and $[8, 8]$.

In the second example the longest *Golden Age* is the interval $[15, 22]$.