

# Difference

ACM International Collegiate Programming Contest 2018

A *smallest different sequence* (SDS) is a sequence of positive integers created as follows:  $A_1 = r \geq 1$ . For  $n > 1$ ,  $A_n = A_{n-1} + d$ , where  $d$  is the smallest positive integer not yet appearing as a value in the sequence or as a difference between two values already in the sequence. For example, if  $A_1 = 1$ , then since 2 is the smallest number not in our sequence so far,  $A_2 = A_1 + 2 = 3$ . Likewise  $A_3 = 7$ , since 1, 2 and 3 are already accounted for, either as values in the sequence, or as a difference between two values. Continuing, we have 1, 2, 3, 4, 6, and 7 accounted for, leaving 5 as our next smallest difference; thus  $A_4 = 12$ . The next few values in this SDS are 20, 30, 44, 59, 75, 96, ... For a positive integer  $m$ , you are to determine where in the SDS  $m$  first appears, either as a value in the SDS or as a difference between two values in the SDS. In the above SDS, 12, 5, 9 and 11 first appear in step 4.

## Input

Input consists of a single line containing two positive integers  $A_1$   $m$  ( $1 \leq r \leq 100, 1 \leq m \leq 200\,000\,000$ ).

## Output

Display the smallest value  $n$  such that the sequence  $A_1, \dots, A_n$  either contains  $m$  as a value in the sequence or as a difference between two values in the sequence. All answers will be  $\leq 10\,000$ .