

## A-series

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            1 second  
Memory limit:         256 megabytes

There are  $N + 1$  different sizes of paper:  $A_0, A_1, A_2, \dots, A_N$ , where each size is twice larger than the next one.

You have  $a_0$  pieces of paper of size  $A_0$ ,  $a_1$  of size  $A_1$ ,  $\dots$ ,  $a_N$  pieces of size  $A_N$ . You want to obtain **at least**  $b_0$  pieces of size  $A_0$ ,  $b_1$  of size  $A_1$ ,  $\dots$ ,  $b_N$  pieces of size  $A_N$ . At any point you can fold and cut a paper in half, obtaining two pieces of smaller size (e.g.  $A_4 \rightarrow A_5 \times 2$ ). What is the minimum number of cuts needed to obtain the required pieces?

### Input

The first line contains a single integer  $N$  ( $1 \leq N \leq 2 \cdot 10^5$ ).

The second line contains  $N + 1$  integers  $a_0, a_1, \dots, a_N$  ( $0 \leq a_i \leq 10^9$ ).

The third line contains  $N + 1$  integers  $b_0, b_1, \dots, b_N$  ( $0 \leq b_i \leq 10^9$ ).

### Output

Output a single integer — the minimum number of cuts needed to obtain the required pieces, or  $-1$ , if it's not possible to obtain them.

### Examples

standard input	standard output
1 10 0 0 19	10
1 10 0 0 21	-1
3 2021 11 21 10 10 21 11 2021	1758