Problem N. 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: $A0$, $A1$, $A2$, ..., AN, where each size is twice larger than the next one.

You have a_0 pieces of paper of size $A0$, a_1 of size $A1$, ..., a_N pieces of size AN. You want to obtain **at least** b_0 pieces of size $A0$, b_1 of size $A1$, ..., b_N pieces of size AN. At any point you can fold and cut a paper in half, obtaining two pieces of smaller size (e.g. $A4 \to A5 \times 2$). What is the minimum number of cuts needed to obtain the required pieces?

Input

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

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

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

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