PROBLEM A —LIMIT 1 SECOND

Your friend and you took a true/false exam of n questions. You know your answers, your friend's answers, and that your friend got k questions correct.

Compute the maximum number of questions you could have gotten correctly.

Input

The first line of input contains a single integer k.

The second line contains a string of n ($1 \le n \le 1000$) characters, the answers you wrote down. Each letter is either a 'T' or an 'F'.

The third line contains a string of n characters, the answers your friend wrote down. Each letter is either a 'T' or an 'F'.

The input will satisfy $0 \le k \le n$.

Output

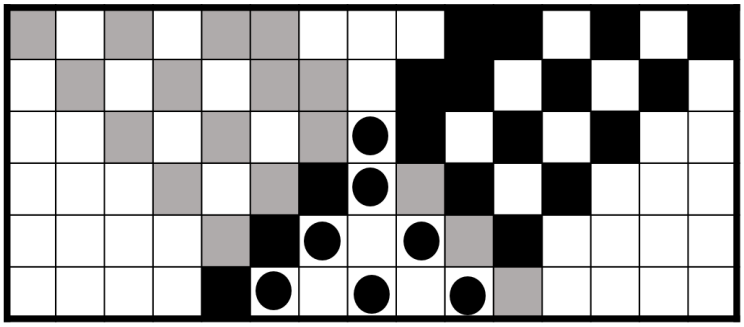
Print, on one line, the maximum number of questions you could have gotten correctly.

Sample Input and Output

3 FTFFF TFTTT	2

6 TTFTFFTFTF TTTTFFTTTT	9

PROBLEM B — LIMIT 1 SECOND



The Goldbach Conjecture states that any even number $x \geq 4$ can be expressed as the sum of two primes. It can be verified that the conjecture is true for all $x \leq 10^6$.

Define a *Goldbach step* as taking x ($4 \leq x \leq 10^6$), finding primes p and q (with $p \leq q$) that sum to x, and replacing x with $q - p$. If there are multiple pairs of primes which sum to x, we take the pair with the largest difference. That difference must be even and less than x. Therefore, we can repeat more Goldbach steps, until we can reach a number less than 4.

Given x, find how many Goldbach steps it takes until reaching a number less than 4.

Input

The input will consist of a single integer x ($4 \leq x \leq 10^6$).

Output

Print, on a single line, the number of Goldbach steps it takes to reach a number less than 4.

Sample Input and Output

20	3
30	4
40	5

50	6
60	7
70	8

Problem C — limit 1 second

A contest setter wants to determine the time limits for a given problem. There are n model solutions, and solution k takes t_k milliseconds to run on the test data. The contest setter wants the time limit to be an integer number of seconds, and wants the time limit to be at least s times larger than the slowest model solution. Compute the minimum time limit the contest setter can set.

Input

The first line of input contains two space-separated integers n and s ($1 \leq n \leq 100$ and $1 \leq s \leq 20$). The second line of input contains n space-separated integers $t_1, \ldots, t_n$ ($1 \leq t_k \leq 2000$ for all $k = 1, \ldots, n$).

Output

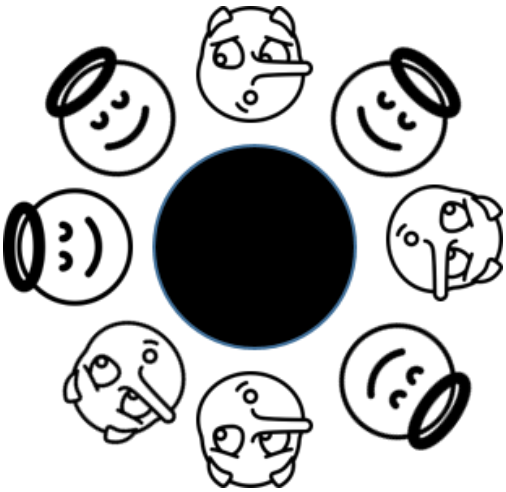
Print, on one line, the minimum time limit (in seconds) as a single integer.

Sample Input and Output

2 5 200 250	2

3 4 47 1032 1107	5

PROBLEM D — LIMIT 1 SECOND



There are n people in a circle, numbered from 1 to n, each of whom always tells the truth or always lies.

Each person i makes a claim of the form: "the number of truth-tellers in this circle is between a_i
and b_i, inclusive."

Compute the maximum number of people who could be telling the truth.

Input

The first line contains a single integer n ($1 \le n \le 10^3$). Each of the next n lines contains two space-separated integers a_i and b_i ($0 \le a_i \le b_i \le n$).

Output

Print, on a single line, the maximum number of people who could be telling the truth. If the given set of statements is inconsistent, print `-1` instead.

Sample Input and Output

3 1 1 2 3 2 2	2
8 0 1 1 7 4 8 3 7 1 2 4 5 3 7 1 8	-1