The 18th Japanese Olympiad in Informatics (JOI 2018/2019)
Spring Training Camp/Qualifying Trial
March 19–25, 2019 (Komaba/Yoyogi, Tokyo)

Contest Day 3 – Lamps

Lamps

There are N lamps in a row at a long hallway. The lamps are numbered from 1 to N. Each lamps has a state of either off or on. There is a special mechanism to change the states of the lamps. In an operation, we can do one of the followings:

- Choose integers p and q with $1 \leq p \leq q \leq N$, and make the lamps $p, p+1, \ldots, q$ off.
- Choose integers p and q with $1 \leq p \leq q \leq N$, and make the lamps $p, p+1, \ldots, q$ on.
- Choose integers p and q with $1 \leq p \leq q \leq N$, and toggle the states of the lamps $p, p+1, \ldots, q$ (off to on, or on to off).

Current states of the lamps are represented by a string A of length N. The i-th ($1 \leq i \leq N$) character of A is 0 if the lamp i is off, and 1 if on. We want to make the states of the lamps to be those represented by a string B of length N, with as few operations as possible. The i-th ($1 \leq i \leq N$) character of B is 0 if we want to make the lamp i off, and 1 if on.

Write a program which, given the number of lamps, the current states and the target states, calculates the minimum number of operations needed to achieve the target states.

Input

Read the following data from the standard input.

N
A
B

Output

Write one line to the standard output. The output should contain the minimum number of operations needed to achieve the target states.

Constraints

- $1 \leq N \leq 1\,000\,000$.
- A and B are strings of length N.

- Each character in A and B is either 0 or 1.

Subtasks

1. (6 points) $N \leq 18$.
2. (41 points) $N \leq 2\,000$.
3. (4 points) Each character in A is 0.
4. (49 points) No additional constraints.

Sample Input and Output

Sample Input 1	Sample Output 1
8	4
11011100	
01101001	

In this sample input, we can achieve the target states in 4 operations, for example as follows:

1. Toggle the states of the lamps 1, 2, 3 and 4. The states of the lamps become 00101100.
2. Make the lamp 2 on. The states of the lamps become 01101100.
3. Toggle the states of the lamps 6, 7 and 8. The states of the lamps become 01101011.
4. Make the lamps 6 and 7 off. The states of the lamps become 01101001.

Since it is impossible to achieve the target states in less than 4 operations, output 4.

Sample Input 2	Sample Output 2
13	3
1010010010100	
0000111001011	

Sample Input 3	Sample Output 3
18	5
001100010010000110	
110110001000100101	