# 2023 Canadian Computing Olympiad <br> Day 2, Problem 1 <br> Flip it and Stick it 

Time Limit: 1 second

## Problem Description

Finn is playing a game of "Flip it and Stick it" which is abbreviated as FiSi. FiSi is a one-player game played on two strings, $S$ and $T$, of 0 s and 1s. Finn is allowed to make moves of the following form:

- Select a substring of $S$ and reverse it, gluing the pieces of the string back together in their original order to form the new string $S$.

For example, Finn may take the string $S=101100$, take the substring 011 starting at index 2 (assuming 1-based string indexing), and create the string $S=111000$ in one move.

Finn wins the game if $S$ does not contain $T$ as a substring. Your task is to help Finn determine the length of the shortest winning sequence of moves or tell him that the game cannot be won.

## Input Specification

The first line of input contains the string $S(1 \leq|S| \leq 200000)$.
The second line of input contains the string $T(1 \leq|T| \leq 3)$.
In the table below, $T_{1}$ is the first bit in $T, T_{2}$ is the second bit in $T$, and $T_{3}$ is the third bit in $T$, when reading from left-to-right.

| Marks Awarded | Bounds on $T$ |
| :---: | :---: |
| 1 mark | $\|T\|=1$ |
| 3 marks | $\|T\|=2, T_{1} \neq T_{2}$ |
| 4 marks | $\|T\|=2$ |
| 5 marks | $\|T\|=3, T_{1} \neq T_{3}$ |
| 5 marks | $\|T\|=3, T_{1} \neq T_{2}$ |
| 7 marks | $\|T\|=3$ |

## Output Specification

Output the minimum number of moves needed or -1 if it is impossible to win the game.

## Sample Input 1

100110
10

## Output for Sample Input 1

2

## Explanation of Output for Sample Input 1

Finn starts with the string 100110. He cannot avoid 10 as a substring in one move, but he can in two moves.

For example, his first move could be to reverse the substring from index 4 to index 6 (110) to get 100011. Then, his second move can be to reverse the substring from index 1 to index 4 (1000) to get 000111, which does not have 10 as a substring.

Sample Input 2
000
00

Output for Sample Input 2
-1

## Explanation of Output for Sample Input 2

No matter how many moves Finn makes, the string $S$ will always contain $T$ as a substring.

