

## Problem 5: Count the Number of Zeros in a Binary String

### Problem Statement:

You are given a binary string  $S$  of the form  $1^m 0^n$ , where the string consists of  $m$  ones followed by  $n$  zeroes, and  $m + n = k$ . Your task is to design a divide-and-conquer algorithm that finds the number of zeroes in the binary string in  $O(\log k)$  time.

### Input:

The first line contains an integer  $k$  ( $1 \leq k \leq 10^6$ ), representing the length of the binary string  $S$ .

The second line contains a binary string  $S$  of length  $k$ , where the first  $m$  characters are ones, followed by the next  $n$  characters which are zeros.

### Output:

Print a single integer, the number of zeroes in the binary string  $S$ .

Examples:

Input:

10

1111100000

Output:

5

Input:

7

1110000

Output:

4