

## Switches 2

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            1 second  
Memory limit:         256 megabytes

There are  $N$  light switches in a room. The state of these  $N$  light switches is represented by a binary string  $S$  of length  $N$ . The  $i$ -th bit of  $S$  is 1 if the  $i$ -th switch is turned on and 0 otherwise.

Unfortunately, you are trapped in this room for  $T$  seconds. Since you have nothing better to do, you will flip **exactly one** light switch every second. At the end of  $T$  seconds, all the light switches should be switched off as it is wasteful to leave lights on after you have left a room.

How many ways can you accomplish this task modulo 2.

### Input

The first line of input contains 2 integers  $N$  and  $T$  ( $1 \leq N \leq 10^7, 1 \leq T \leq 10^{10^7}$ ), the number of light switches and the time you are trapped in the room respectively.

The second line of input contains a binary string of length  $N$ , representing the state of the switches.

### Output

Output the number of ways modulo 2.

### Examples

standard input	standard output
4 1 0010	1
5 69 01000	1
12 20 101010101010	0
5 207306908990212166607450556245704 00000	1

### Note

For the first sample testcase, there is only 1 ways to accomplish this task. So print 1.

For the second sample testcase, there are 105879118406787698830759374662555327479673080561 way to accomplish this task. So print 1.

For the third sample testcase, there are 1868575429644779520 ways to accomplish this task. So print 0.