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## ACM Challenges Lab

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### Exercise 1 – *Even pairs*

You are part of a team to develop a new kind of pseudorandom number generator (PRNG). To gauge how good your algorithm is at producing random sequences of bits, you are running several different statistical tests.

For example, if  $x_1, \dots, x_n$  was a truly random sequence of bits, then it would have the property that the sum  $x_i + \dots + x_j$  is even for about half of the pairs  $1 \leq i \leq j \leq n$  (and odd for the other half).

To check whether this is the case if  $x_1, \dots, x_n$  are generated by your PRNG, you need to be able to count the number of pairs  $1 \leq i \leq j \leq n$  for which the sum is even.

**Input** The first line of the input is an integer  $n$  denoting the size of the dataset.

The second line of the input contains  $n$  values  $x_1, \dots, x_n$ , separated by spaces. Each value  $x_i$  is either 0 or 1.

**Output** The output should consist of a single line containing the number of pairs  $1 \leq i \leq j \leq n$  such that the sum  $x_i + \dots + x_j$  is even.

#### Sample Input

```
4
0 1 1 1
```

#### Sample Output

```
4
```

(\* Points)100