

# Problem 1: I Spent CALICO funds on 1000 contestants

## 4 Points

Problem ID: doubleit

Rank: 1

## Introduction

After [doom scrolling Youtube Shorts](#) a little bit too long, Big Ben has decided to pursue his dreams of becoming a professional [TikToker/TikTokker](#). Following in [Mr. Beast's](#) vision, Big Ben (or Mr. Ben) engages in philanthropy by offering the money he made from the [CALICasinO](#). Following Tik Tok trends, he is asking people if they want to double the money or give it to the next person. Help Big Ben not go broke from spending too much money!



## Problem Statement

Big Ben faces a line of  $N$  people, labeled  $P_1, P_2, \dots, P_N$ . Starting with  $P_1$ , he offers them \$1 and gives them two options:

- *Take* the current offer: Big Ben pays them that amount and resets the next offer to \$1.
- [Double it and give it to the next person](#): they receive nothing, and the next person is offered twice the current amount.

Each person is either a  $T$  (they always *Take*) or a  $D$  (they always *Double*).

Given the sequence of characters ( $T$  or  $D$ ) as a string representing each person, compute the total amount of money Big Ben pays out. Money offered but not taken at the end is not counted towards the total Big Ben pays.

*Note: Templates are available for this problem—and **all other problems in this contest**—in Python, Java, and C++! Find them in the [contest.zip provided at the start of the contest](#). Templates handle input and output for you, so you can just fill out a single function!*

## Input Format

The first line of the input contains a single integer  $T$  denoting the number of test cases that follow.

For each test case:

- The first line contains a single integer  $N$  denoting the number of people in line.
- The second line contains a string of  $N$  characters denoting the sequence  $P_1, P_2, \dots, P_N$  of people in line. Each character  $P_i$  is either  $T$  or  $D$ , denoting that the person *Takes* or *Doubles*, respectively.

## Output Format

For each test case, output a single integer denoting the total amount of money Big Ben pays out.

## Constraints

$$1 \leq T \leq 100$$

$$1 \leq N \leq 1000$$

$P$  only contains the uppercase letters  $T$  and  $D$

The total amount of money Big Ben pays out will not exceed  $10^9$ .

# Sample Test Cases

## Sample Input

[Download](#)

```
5
5
TTTTT
5
DDDDT
5
TDDDD
5
TDTDT
1
T
```

## Sample Output

[Download](#)

```
5
16
1
5
1
```

## Main Sample Explanations

For test case #1, 5 dollars is needed as Big Ben gives out  $1 + 1 + 1 + 1 + 1 = 5$  dollars.

For test case #2, 16 dollars is needed as Big Ben has his initial offer doubled four times to  $2 \times 2 \times 2 \times 2 = 16$ . The last person is offered 16 dollars and takes it.

For test case #3, 1 dollar is needed as Big Ben pays out 1 dollar to the first person in line. The next person is offered 1 dollar, which is eventually doubled by the others in line to 16 dollars. However, since nobody chooses to *take* after the first person, Big Ben only has to pay out the initial 1 dollar.

For test case #4, 5 dollars is needed as:

- Person 1 is offered 1 dollar and takes 1 dollar.
- Person 2 is offered 1 dollar and doubles it to 2 dollars.
- Person 3 is offered 2 dollars and takes 2 dollars.
- Person 4 is offered 1 dollar and doubles it to 2 dollars.
- Person 5 is offered 2 dollars and takes 2 dollars.