

1.String_Game

Like Every year, again this year a coding challenge was conducted by the geek's man group. Based on these challenges, geeks man group offers scholarships, goodies, prize money, and other stuff to students who participated in the contest. This year, Alex and his friend Bob participated in the contest. Alex solved all the questions while Bob didn't as he spent so much time on one question in which he was having a binary string SS of even length NN and twisted the little by adding that string only contains $N/2$ zero and $N/2$ ones. To make the question more complex it's added that he can reverse any substring of SS in one operation. So he has to find the minimum number of operations to make the string SS alternating. So he wants your help in figuring out the solution as he feels dishonored if he takes help from Alex. **Note:** A substring of a string is a contiguous subsequence of that string SS and its alternating if $S_i \neq S_{i+1}$ for all i .

Input Format

The first contains an integer TT where TT denotes the number of test cases. The first line of each test case contains a single integer NN where NN denotes the length of the string SS . The second line of each test case contains binary string SS of length NN and has exactly $N/2$ zeroes and $N/2$ ones.

Output Format

Print the minimum operations required to make string SS alternating.

Time Limit

1 second

Constraints

$1 \leq T \leq 5 \cdot 10^4$ $1 \leq T \leq 5 \cdot 10^4$ $2 \leq N \leq 10^5$ $2 \leq N \leq 10^5$ **Note:** It's guaranteed that the total sum of NN over test cases doesn't exceed 10^5 .

Example

Sample Input

```
3 4 0110 8 11101000 4 1001
```

Sample Output

```
1 2 1
```

Sample Test case Explanation

In the second test case, we can make it in two operations. 1.1. **11101000** \rightarrow **10101100**. 2.2. **10101100** \rightarrow **10101010**.

2.Zip Linked List

You are given the head of the Singly linked list of arbitrary length KK . Your task is to zip the linked list **in-place** (i.e., doesn't create a brand new linked list) and return it's head.

A linked list is zipped if it's nodes are in the following order, where KK is the length of the linked list:

- 1st node -> Kth node -> 2nd node -> (k-1)th node -> 3rd node -> (k-2)th node ->

Note - You can assume that the input linked list will always have atleast one node, in other words, the head will never be **NULL**.

Input Format

The first line of input contains a single integer TT - denoting the number of test cases. Each test case follows:

- The first line of each test case contains a single integer KK , denoting the size of the linked list
- The second line contains KK space-separated integers - denoting the elements of the list.

Output Format

The output contains TT lines, each line containing the modified list. **Note** - You only need to implement `zipLinkedList()`, and return the head of the linked list.

Constraints

$$1 \leq T \leq 100 \quad 1 \leq T \leq 100 \quad 1 \leq K \leq 10000 \quad 1 \leq K \leq 10000$$

Time Limit

1 second

Example

Sample Input

2 7 1 2 6 3 4 5 6 2 7 8

Sample Output

1 6 2 5 6 4 3 7 8

3.Clever Friend

Aman and Raman are friends as well as neighbors. They used to share everything, play together, and like to spend most of the time together. Raman being clever also sometimes take advantage of Aman like give him the homework to complete by making excuses and his projects are also made by Aman. As exams are going on and both of them are preparing for exams then suddenly Aman realizes that his science book is missing so he asked Raman to give him the book for few hours but being clever Raman puts condition and provided him with the array AA with NN integers and twisted the little by adding that he has to find the count of the cool/ subarrays i.e.the subarray which has the sum of all elements in it a perfect square and told Aman to solve this first if he needs the book. So tomorrow they are having the exam, so Aman wants your help in solving it so that he can get the book and can prepare for his exam.

Input Format

The first line of the input contains an integer NN where NN denotes the length of the array. The second line contains NN space integers $A_1, A_2, A_3, \dots, A_N$.

Output Format

Print the count of the subarray for which the sum of the elements is a perfect square.

Time Limit

1 second

Constraints

$1 \leq N \leq 5 \times 10^3$ $1 \leq A_i \leq 10^6$

Example

Sample Input

4 1 4 3 2

Sample Output

3

Sample Test case Explanation

The given array is : 1 1 4 4 3 3 2 2

let us list the sum of all possible subarrays: $[1,1]=1$ $[1,2]=1+4=5$ $[1,3]=1+4+2=7$ $[1,4]=1+4+2+3=10$ $[2,2]=4$ $[2,3]=4+2=6$ $[2,4]=4+2+3=9$ $[3,3]=2$ $[3,4]=2+3=5$ $[4,4]=3$

[1,4,9]=3

4.Add One to the Number

You are given a linked list representing a number such that each individual node acts as a digit of the number. The list HEADHEAD->11->22->33->NULLNULL corresponds to the number 123. Your task is to add 1 to this number.

Input Format

The first line contains an integer TT , number of test cases. Then follows TT test cases. Each test case consists of two lines. The first line contains an integer NN representing length of the linked list The second line contains NN space separated integers representing nodes of a linked list.

Output Format

The output contains TT lines, each line containing the modified number as a linked list. **Note** - You only need to implement `addOneToList()` function, and return the head of the linked list.

Example

Sample Input

2 3 1 2 3 4 9 9 9 9

Sample Output

1 2 4 1 0 0 0 0

4.h

There are N employees sitting in consecutive cubicles, we have to send a few of them onsite, but each time we send one employee onsite, his cubicle becomes empty. Now, the other employees from both sides of that empty cubicle stop working until they are given a gift. The gifts are given on both sides of the empty cubicle until we reach the end or found another cubicle.

Input Format:

- Number of cubicles
- Index numbers of people to be sent

Output Format:

Minimum number of gifts needed

2) [Glowing Bulbs problem](#)

3) [Gold mine problem](#)

You also need to be thorough with the following data structures related problems.

Find the Minimum and Maximum values of given expression with + and *

Program to find the minimum and maximum values of given expression is discussed here. Given an algebraic expression with + and *, find the minimum and maximum values.

For example,

Sample Input:

1+2*3+4*5

Sample Output:

27

105

Explanation:

$1 + (2 * 3) + (4 * 5) = 27$ (Minimum)

$(1 + 2) * (3 + 4) * 5 = 105$ (Maximum)

- Implement Depth First Search (DFS)
- Implement Breadth First Search (BFS)
- Number of Islands
- Subset sum problem
- Rat in a maze problem
- Treasure and cities problem
- 0-1 Knapsack problem
- Sudoku problem
- Minimum and maximum values of a given expression
- Minimum sum partition problem
- Number of ways to reach the nth stair