

Forming Groups

Input file: **standard input**
Output file: **standard output**
Time limit: 5 seconds
Memory limit: 1024 megabytes

There are n students, numbered from 1 to n , who need to form groups for the upcoming hackathon. You are student 1, the captain of the students. Student i has *skill level* a_i .

Students 2 to n are standing in a line from left to right in order. You can choose to stand in between any two students, to the left of student 2, or to the right of student n . You cannot change the order of the $n - 1$ students.

You can also choose the number of groups k ($k > 1$ and k must be a divisor of n) to participate in the hackathon. The groups will be numbered from 1 to k . After you have chosen your position and the value of k , the students will be grouped as follows:

- The first student from the left will be assigned to group 1.
- The second student from the left will be assigned to group 2.
- ...
- The k -th student from the left will be assigned to group k .
- The $(k + 1)$ -th student from the left will be assigned to group 1.
- The $(k + 2)$ -th student from the left will be assigned to group 2.
- ...
- The n -th student from the left will be assigned to group k .

Formally, for each j ($1 \leq j \leq k$) and for each i ($0 \leq i < n/k$), the $(i \times k + j)$ -th student from the left will be assigned to group j . It can be shown that each student will be assigned to exactly one group and all the groups have the same number of students.

The *skill level of a group* is the sum of the skill levels of the students inside the group. By choosing where you stand as well as the number of groups k optimally, you want to minimize the ratio x_{\max}/x_{\min} where

- x_{\max} is the skill level of the group with the largest skill level, and
- x_{\min} is the skill level of the group with the smallest skill level.

Input

The first line of input contains one integer t ($1 \leq t \leq 100\,000$) representing the number of test cases. After that, t test cases follow. Each of them is presented as follows.

The first line of a test case contains two integers n and a_1 ($2 \leq n \leq 10^6$; $1 \leq a_1 \leq 1000$). The next line contains $n - 1$ integers a_2, a_3, \dots, a_n ($1 \leq a_i \leq 1000$ for all i).

The sum of n across all test cases in one input file does not exceed 10^6 .

Output

For each test case, output one line containing two positive integers p and q such that the minimum ratio is p/q . The fraction p/q should be irreducible. In other words, p and q should be coprime.

Example

standard input	standard output
2	1 1
4 1	10 3
2 1 2	
3 10	
4 3	

Note

Explanation for the sample input/output #1

In the first test case, by standing between students 2 and 3 (or between students 3 and 4) and choosing $k = 2$, group 1 will have the skill level $2 + 1$ and group 2 will have the skill level $1 + 2$, thus the ratio is $1/1$.

In the second test case, the only choice for the value of k is 3.