Non-negative Partial Sums

You are given a sequence of n numbers $a_0, \ldots, a_{n-1}$. A cyclic shift by k positions $(0 \leq k \leq n-1)$ results in the following sequence: $a_k, a_{k+1}, \ldots, a_{n-1}, a_0, a_1, \ldots, a_{k-1}$. How many of the n cyclic shifts satisfy the condition that the sum of the first i numbers is greater than or equal to zero for all $1 \leq i \leq n$?

Input

The first line of the input contains an integer t. t test cases follow, each of them separated by a blank line.

Each test case consists of two lines. The first contains the number n, the number of integers in the sequence. The second contains n integers $a_0, \ldots, a_{n-1}$ representing the sequence of numbers.

Output

For each test case, output one line containing "Case #i: x" where i is its number, starting at 1 and x is the number of cyclic shifts of the given sequence which satisfy the condition stated above.

Constraints

- $1 \leq t \leq 20$
- $1 \leq n \leq 10^6$
- $-1000 \leq a_i \leq 1000$

Sample Input 1	Sample Output 1
3 3 2 2 1 3 -1 1 1 1 -1	Case #1: 3 Case #2: 2 Case #3: 0