
Mọi thắc mắc và góp ý về đề bài các bạn liên hệ với mình qua địa chỉ email:

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Các bạn có thể tham khảo video lời giải của mình tại

https://cutt.ly/WmI0f6O

TWO POINTERS

Problem A. Merging arrays

You are given two arrays, sorted in non-decreasing order. Merge them into one sorted array.

Input

The first line contains integers n and m, the sizes of the arrays ($1 \le n,m \le 10^5$). The second line contains n integers ai, elements of the first array, the third line contains m integers bi, elements of the second array ($-10^9 \le ai,bi \le 10^9$).

Output

Print n+m integers, the merged array.

Example

Input	Output
6 7 1 6 9 13 18 18 2 3 8 13 15 21 25	1 2 3 6 8 9 13 13 15 18 18 21 25

Source code tham khảo : https://paste.ofcode.org/4kVdHF2m85ybSMUfDieuqH

Problem B. Number of smaller

You are given two arrays, sorted in non-decreasing order. For each element of the second array, find the number of elements in the first array strictly less than it.

Input
The first line contains integers nn and mm, the sizes of the arrays ($1 \le n,m \le 10^5$). The second line contains n integers ai, elements of the first array, the third line contains m integers bi, elements of the second array ($-10^9 \le ai,bi \le 10^9$).
Output
Print m numbers, the number of elements of the first array less than each of the elements of the second array.

Example

Input	Output
6 7 1 6 9 13 18 18 2 3 8 13 15 21 25	1 1 2 3 4 6 6

Source code tham khảo : https://paste.ofcode.org/3aAdGaTeyxTqSCznwbT5gNY

Problem C. Number of Equal

You are given two arrays aa and bb, sorted in non-decreasing order. Find the number of pairs (i,j) for which ai=bj.

Input
The first line contains integers nn and mm, the sizes of the arrays ($1 \le n,m \le 10^5$). The second line contains n integers ai, elements of the first array, the third line contains m integers bi, elements of the second array ($-10^9 \le ai,bi \le 10^9$).
Output

Print one number, the answer to the problem.

Example

Input	Output
8 7 1 1 3 3 3 5 8 8 1 3 3 4 5 5 5	11

Source code tham khảo : https://paste.ofcode.org/37Qns7S7MHjSWNKvL66grw6

Problem D. Segment With Small Sum

Given an array of n integers ai. Let's say that the segment of this array a[l..r] ($1 \le l \le r \le n$) is good if the sum of elements on this segment is at most s. Your task is to find the longest good segment.

InputThe first line contains integers nn and s ($1 \le n \le 10^5$, $1 \le s \le 10^{18}$). The second line contains integers ai ($1 \le ai \le 10^9$).

Output

Print one integer, the length of the longest good segment. If there are no such segments, print -1.

Example

Input	Output
7 20 2 6 4 3 6 8 9	4

Source code tham khảo : https://paste.ofcode.org/cgsbXv8b7mRkAUCmJusfW3

Problem E. Segment With big Sum

Given an array of n integers aiai. Let's say that the segment of this array a[l..r] ($1 \le l \le r \le n$) is good if the sum of elements on this segment is at least s. Your task is to find the shortest good segment.

Input

The first line contains integers n and s ($1 \le n \le 10^5$, $1 \le s \le 10^{18}$). The second line contains integers ai ($1 \le ai \le 10^9$).

Output

Print one integer, the length of the shortest good segment. If there are no such segments, print -1.

Example

Input	Output
7 20 2 6 4 3 6 8 9	3

Source code tham khảo : https://paste.ofcode.org/ibyJ3WWcUgCgegVhSEuPdv

Problem F. Number of Segments with small sum

Given an array of n integers ai. Let's say that the segment of this array a[l..r] ($1 \le l \le r \le n$) is good if the sum of elements on this segment is at most s. Your task is to find the number of good segments.

Input

The first line contains integers n and s ($1 \le n \le 10^5$, $1 \le s \le 10^{18}$). The second line contains integers ai ($1 \le ai \le 10^9$).

Output

Print one integer, the number of good segments.

Example

Input	Output
7 20 2 6 4 3 6 8 9	19

Source code tham khảo : https://paste.ofcode.org/BbjqZCju7Si8g6yzXxLWCg

Problem G. Number of Segments with big sum

Given an array of n integers ai. Let's say that the segment of this array a[l..r] ($1 \le l \le r \le n$) is good if the sum of elements on this segment is at least s. Your task is to find the number of good segments.

Input

The first line contains integers n and s ($1 \le n \le 10^5$, $1 \le s \le 10^{18}$). The second line contains integers ai ($1 \le ai \le 10^9$).

Output

Print one integer, the number of good segments.

Example

Input	Output
7 20 2 6 4 3 6 8 9	9

Source code tham khảo : https://paste.ofcode.org/MZzU5VWvq3YckUKDqwSTUE

Problem H. Segments with small set

Given an array of n integers ai. Let's say that a segment of this array a[l..r] ($1 \le l \le r \le n$) is good if there are no more than k unique elements on this segment. Your task is to find the number of different good segments.

Input

The first line contains integers n and k ($1 \le n \le 10^5$, $0 \le k \le n$). The second line contains integers ai ($1 \le ai \le 10^5$).

Output

Print one integer, the number of good segments.

Example

Input	Output
7 3 2 6 4 3 6 8 3	20

Source code tham khảo : https://paste.ofcode.org/ULHPishdrHuxbgFWHerNrG

Problem I. Segment with small Spread

Given an array of n integers ai. Let's say that a segment of this array a[l..r] ($1 \le l \le r \le n$) is good if the difference between the maximum and minimum elements on this segment is at most k. Your task is to find the number of different good segments.

Input

The first line contains integers n and k ($1 \le n \le 10^5$, $0 \le k \le 10^{18}$). The second line contains integers ai ($1 \le ai \le 10^{18}$).

Output

Print the number of good segments.

Example

Input	Output
7 3 2 6 4 3 6 8 9	16

Source code tham khảo : https://paste.ofcode.org/ZvVbAy2MjtAhtCDSqEjWah

Độ phức tạp của code trên là O(nlogn), dễ tiếp cận hơn, các bạn có thể tham khảo cách sử dụng minimum queue để độ phức tạp là O(n).

Link tham khảo Minimum Stack/ Minimum Queue :

https://cp-algorithms.com/data_structures/stack_queue_modification.html