

### 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 ( $1 \leq n, m \leq 10^5$ ). The second line contains  $n$  integers  $a_i$ , elements of the first array, the third line contains  $m$  integers  $b_i$ , elements of the second array. ( $-10^9 \leq a_i, b_i \leq 10^9$ ).

Output

Print  $n + m$  integers, the merged array.

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

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

Output

Print  $m$  numbers, the number of elements of the first array less than each of the elements of the second array.

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

### Problem C : Number of equal

You are given two arrays, sorted in non-decreasing order. Find the number of pairs  $(i, j)$  for which  $a_i = b_j$ .

Input

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

Output

Print one number, the answer to the problem.

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

### Problem D : Segment with small sum

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

Input

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

Output

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

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

### Problem E : Segment with big sum

Given an array of  $n$  integers  $a_i$ . Let's say that the segment of this array  $a[l ; r]$  ( $1 \leq l \leq r \leq n$ ) 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  $s$  ( $1 \leq n \leq 10^5$ ,  $1 \leq s \leq 10^{18}$ ). The second line contains integers  $a_i$  ( $1 \leq a_i \leq 10^9$ ).

Output

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

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

### Problem F : Number of segments with small sum

Given an array of  $n$  integers  $a_i$ . Let's say that the segment of this array  $a[l ; r]$  ( $1 \leq l \leq r \leq n$ ) 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  $s$  ( $1 \leq n \leq 10^5$ ,  $1 \leq s \leq 10^{18}$ ). The second line contains integers  $a_i$  ( $1 \leq a_i \leq 10^9$ ).

Output

Print one integer, the number of good segments.

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

### Problem G : Number of segments with big sum

Given an array of  $n$  integers  $a_i$ . Let's say that the segment of this array  $a[l ; r]$  ( $1 \leq l \leq r \leq n$ ) 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  $s$  ( $1 \leq n \leq 10^5$ ,  $1 \leq s \leq 10^{18}$ ). The second line contains integers  $a_i$  ( $1 \leq a_i \leq 10^9$ ).

Output

Print one integer, the number of good segments.

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

### Problem H : Segments with small set

Given an array of  $n$  integers  $a_i$ . Let's say that the segment of this array  $a[l ; r]$  ( $1 \leq l \leq r \leq n$ ) 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  $k$  ( $1 \leq n \leq 10^5$ ,  $1 \leq k \leq 10^5$ ). The second line contains integers  $a_i$  ( $1 \leq a_i \leq 10^9$ ).

Output

Print one integer, the number of good segments.

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

### Problem H : Segments with small set

Given an array of  $n$  integers  $a_i$ . Let's say that the segment of this array  $a[l ; r]$  ( $1 \leq l \leq r \leq n$ ) 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  $k$  ( $1 \leq n \leq 10^5$ ,  $1 \leq k \leq 10^5$ ). The second line contains integers  $a_i$  ( $1 \leq a_i \leq 10^9$ ).

Output

Print one integer, the number of good segments.

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

### Problem I : Segment with small spread

Given an array of  $n$  integers  $a_i$ . Let's say that the segment of this array  $a[l ; r]$  ( $1 \leq l \leq r \leq n$ ) 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  $k$  ( $1 \leq n \leq 10^5$ ,  $1 \leq k \leq 10^{18}$ ). The second line contains integers  $a_i$  ( $1 \leq a_i \leq 10^{18}$ ).

Output

Print the number of good segments.

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

### Problem J : Two sum

You are given an array of  $n$  integers, and your task is to find two values (at distinct positions) whose sum is  $x$ .

#### Input

The first input line has two integers  $n$  and  $x$ , the array size and the target sum.

The second line has  $n$  integers  $a_1, a_2, \dots, a_n$ , the array values.

#### Output

Print two integers, the positions of the values. If there are several solutions, you may print any of them. If there are no solutions, print IMPOSSIBLE.

#### Constraints

$$1 \leq n \leq 2 \cdot 10^5.$$

$$1 \leq x, a_i \leq 10^9.$$

Input	Output
4 8 2 7 5 1	2 4