Data Structures Problem Set

TASK STATISTICS

Problem 1: Building Heights

Time limit: 1.00 s **Memory limit:** 512 MB

You are given the heights of n buildings in a row. For each building, you need to determine how many consecutive buildings to its right are shorter than it.

In other words, for building i, find the number of buildings in positions $i+1, i+2, ..., n$ that are shorter than building i, until you encounter a building that is taller or equal.

Input

The first input line has an integer n: the number of buildings.

The second line has n integers $h_1, h_2, ..., h_n$: the height of each building.

Output

Print n integers: for each building, the count of consecutive shorter buildings to its right.

Constraints

- $1 \le n \le 2 \cdot 10^5$
- $1 \le h_i \le 10^9$

Example

Input:

```
5
4 3 5 2 1
```

Output:

```
1 0 2 1 0
```

Explanation:

- Building 0 (height 4): Building 1 (height 3) is shorter. Stop at building 2 (height 5 ≥ 4). Count = 1
- Building 1 (height 3): Stop immediately at building 2 (height 5 ≥ 3). Count = 0
- Building 2 (height 5): Buildings 3 and 4 (heights 2, 1) are both shorter. Count = 2
- Building 3 (height 2): Building 4 (height 1) is shorter. Count = 1

• Building 4 (height 1): No buildings to the right. Count = 0

Problem 2: Printer Queue

Time limit: 1.00 s **Memory limit:** 512 MB

There are n tasks in a printer queue, each with a priority value. The printer operates as follows:

- Take the first task from the queue
- If there are tasks with higher priority still in the queue, move this task to the back
- Otherwise, print this task

You are interested in a specific task (initially at position k) and want to know how many tasks will be printed before it.

Input

The first input line has two integers n and k: the number of tasks and the position of your task (0-indexed).

The second line has n integers $p_1, p_2, \ldots, p_n$: the priority of each task.

Output

Print one integer: the number of tasks printed before your task.

Constraints

- $1 \le n \le 2 \cdot 10^5$
- $0 \le k < n$
- $1 \le p_i \le 10^9$

Example

Input:

```
5 2
1 2 3 4 5
```

Output:

```
2
```

Explanation:

Your task is at position 2 (priority 3). The queue processes as follows:

- Tasks with priorities [1,2,3,4,5] enter the queue
- Priority 5 is highest, so tasks 1,2,3,4 all move to the back, then task 5 prints (count = 0)
- Priority 4 is now highest, tasks 1,2,3 move to back, then task 4 prints (count = 1)
- Priority 3 (YOUR TASK) is now highest and prints next (count = 2)