

# 2111. Minimum Operations to Make the Array K-Increasing

## Description

You are given a **0-indexed** array `arr` consisting of `n` positive integers, and a positive integer `k`.

The array `arr` is called **K-increasing** if `arr[i-k] <= arr[i]` holds for every index `i`, where `k <= i <= n-1`.

- For example, `arr = [4, 1, 5, 2, 6, 2]` is K-increasing for `k = 2` because:
  - `arr[0] <= arr[2]` (`4 <= 5`)
  - `arr[1] <= arr[3]` (`1 <= 2`)
  - `arr[2] <= arr[4]` (`5 <= 6`)
  - `arr[3] <= arr[5]` (`2 <= 2`)
- However, the same `arr` is not K-increasing for `k = 1` (because `arr[0] > arr[1]`) or `k = 3` (because `arr[0] > arr[3]`).

In one **operation**, you can choose an index `i` and **change** `arr[i]` into **any** positive integer.

Return *the minimum number of operations required to make the array K-increasing for the given* `k`.

### Example 1:

**Input:** `arr = [5,4,3,2,1], k = 1`

**Output:** `4`

**Explanation:**

For `k = 1`, the resultant array has to be non-decreasing.

Some of the K-increasing arrays that can be formed are `[5, 6, 7, 8, 9]`, `[1, 1, 1, 1, 1]`, `[2, 2, 3, 4, 4]`. All of them require 4 operations.

It is suboptimal to change the array to, for example, `[6, 7, 8, 9, 10]` because it would take 5 operations.

It can be shown that we cannot make the array K-increasing in less than 4 operations.

### Example 2:

**Input:** `arr = [4,1,5,2,6,2], k = 2`

**Output:** `0`

**Explanation:**

This is the same example as the one in the problem description.

Here, for every index `i` where `2 <= i <= 5`, `arr[i-2] <= arr[i]`.

Since the given array is already K-increasing, we do not need to perform any operations.

### Example 3:

**Input:** `arr = [4,1,5,2,6,2], k = 3`

**Output:** `2`

**Explanation:**

Indices 3 and 5 are the only ones not satisfying `arr[i-3] <= arr[i]` for `3 <= i <= 5`.

One of the ways we can make the array K-increasing is by changing `arr[3]` to 4 and `arr[5]` to 5.

The array will now be `[4,1,5, 4, 6, 5]`.

Note that there can be other ways to make the array K-increasing, but none of them require less than 2 operations.

### Constraints:

- `1 <= arr.length <= 105`
- `1 <= arr[i], k <= arr.length`

