# Minimum operations to make all elements equal

Given an array consisting of positive integers, return the minimum number of operations to make all the elements of the array equal. The operations can be addition, multiplication, division, or subtraction.

Brute-Force

To find the element with the highest frequency, we will run two loops. The outer loop picks all the elements one by one and the inner loop finds the frequency of the picked element and compares it with the element with the highest frequency so far. If it is greater, it replaces to be the highest frequent element. After this, we will simply return the "number of elements  - frequency of the most frequent element".

Time complexity: O(n2)

Space complexity: O(1)

Better Approach (Hashing)

Maintain a map that consists of the frequency of all the elements in the array. The highest frequent element in the hash table will be our target element and thus, our answer will be "number of elements - frequency of the target element".

Time complexity: O(n)

Space complexity: O(n)

# Check if the given array contains duplicate elements within k distance

Given an unsorted array that may contain duplicates. Also given a number k which is smaller than the size of the array, returns true if the array contains duplicates within k distance.

Example-1:

Input: k = 3, arr[] = {1, 2, 3, 4, 1, 2, 3, 4}

Output: false

All duplicates are more than k(3) distance away.

1...1(has a distance of 4)

2...2(has a distance of 4)

3...3 and 4...4 are similar

Brute-Force

A Naive solution is to run two loops. The outer loop picks every element ‘arr[i]’ as a starting element, and the inner loop compares all elements which are within k distance of ‘arr[i]’.

Time complexity: O(k\*n)

Space complexity: O(1)

Better Approach (Hashing)

If the array element is already present in our map then get its position from a map and calculate the difference between the current index and the position that we have fetched from the map.

If the difference is greater than k then update the position of the current element in the map

If the difference is less than k then simply return true.