**Counting Sort Algorithm:**

This is one of the techniques to sort the array elements; it performs sorting by calculating the number of occurrences of a particular element in an array. It maintains a separate array to count the number of occurrences of the element; after that, it performs sorting by mapping the count.

As we have already known that it is a sorting algorithm based on the counting of the unique element.

1) Start

2) Count array to maintain the count of the unique elements inside the input.

3) Modify the count array to contain the sum of the previous counts.

4) map data the array and decrees the count by 1.

Time Complexity: **O(n+k)**

**Quick Sort Algorithm:**

Quick Sort is a Divide and Conquer algorithm. It picks an element as pivot and partitions the given array around the picked pivot.

Technically, quick sort follows the below steps:  
**Step 1** − Make any element as pivot  
**Step 2** − Partition the array on the basis of pivot  
**Step 3** − Apply quick sort on left partition recursively  
**Step 4** − Apply quick sort on right partition recursively

Time Complexity: **Best case , Average , Worst case**

**WHICH ALGORITHM PREFORM BETTER IN EACH FILTER?**

**Adaptive :**

In adaptive-median filter: CountingsSort preform better because it consumes a little time.and IT’S Time Complexity: n+k

While quicksort Time Complexity: n^2

**Alpha :**

In Alpha-Trim filter: KthElement preform better because it doesn’t sort at all but it find the max and min then calculate the avg value

While CoutningSort More time due to sorting Process

**Our Approach To To Filter an image:**

Table

Description automatically generated

Graphical user interface, text, application, email

Description automatically generated

Timeline

Description automatically generated