Merge K sorted arrays

Problem

Given k sorted arrays, our task is to combine all of them in such a way that the final array is also a sorted array.

Example

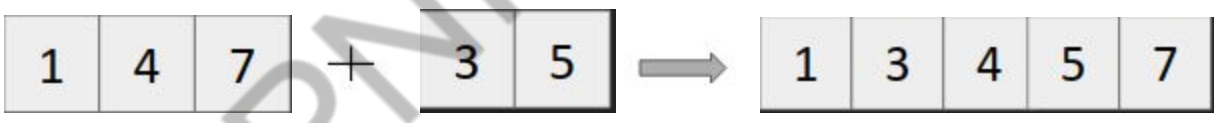
Given the following sorted arrays

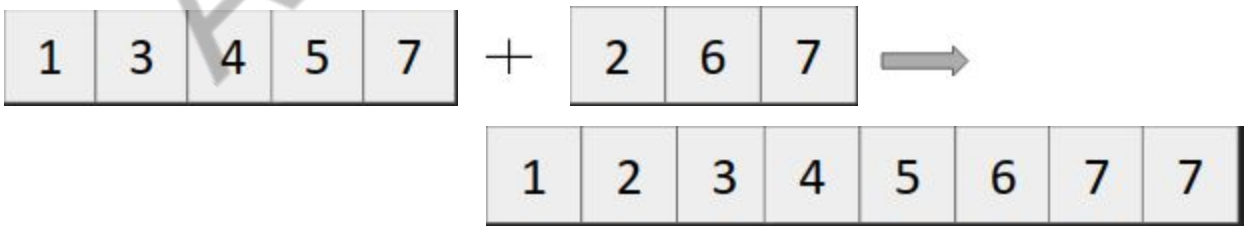
We need to output

Brute force approach

1. Take two arrays and merge them into a sorted array. Repeat this process until we are left with one array. {We have covered merge two sorted arrays in merge sort)

Dry Run





Efficient Solution (Using heaps)

1. Create a MinHeap of pairs, i.e.
   priority_queue<pair<int,int>, vector<pair<int,int>>, greater<pair<int,int>> >
2. Insert {first element, array number} of all the sorted arrays into MinHeap.
3. Pop the top element from the MinHeap and store it into the answer array. Insert the next element of the sorted array into the MinHeap.
4. Keep track of indices of the elements that are being inserted in the answer array using an index array[] whose indices denote the array number and elements represent the index of the last element inserted from that particular array.