V. Imp

Merge Sort

Merging is the process of combining two or more sorted files into the third sorted file. Merge Sort is a Divide and Conquer technique.

Merge sort has three steps to sort an input sequence S with 'n' elements.

1. Divide - partition S into two sequences S1 and S2 of about $n/2$ elements each
2. Recursion - Recursively sort S1 and S2
3. Conquer - Merge S1 and S2 into a sorted sequence.

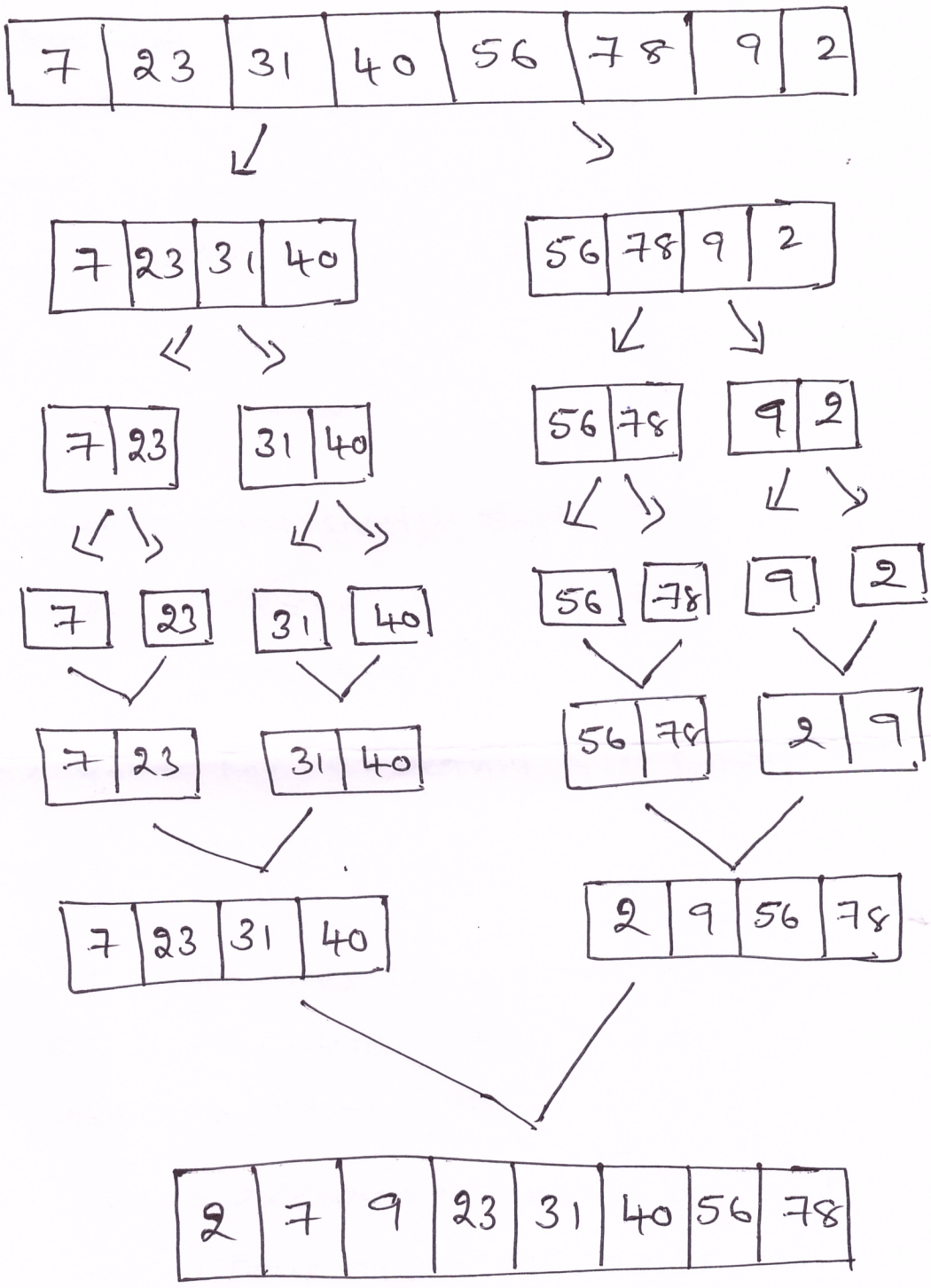
Adv: (a) Good for external file sorting
(b) Can be applied to files of any size

Dis: (a) It requires twice the memory of heap sort because of the second array used to store the sorted list.

(b) It is recursive, which can make it a bad choice for applications that run on machines with limited memory.

Best Case is $O(n \log n)$.
Average Case is $O(n \log n)$
Worst Case is $O(n \log n)$

8. A list has elements 7, 23, 31, 40, 56, 78, 9, 2. Using Merge sort, sort the list.



Note: The algorithm divides the unsorted list into two sub-lists of about half the size. Then, it sorts each sublist recursively by reapplying the merge sort and then merges the two sub-lists back into one sorted list.