

# Merge Sort Algorithm

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## 1 Incremental Approach:

From a given Array we have taken a particular element in each iteration and place it in right place using our Insertion sort technique to sort the given array.

## 2 Divide and Conquer:

1. **Divide** the whole problem into small problems which are similar to the actual problem.
2. **Concure**, solve those small sub problems recursively.
3. **Combine**, cobines those small solutions to get the final solution.

Merge Sort  $\rightarrow$  Divide and Conquer approach.

1. Divide the input array into sub arrays ( $n/2$  lengths two sub arrays)
2. Use a merge sort technique to sort these sub arrays. (it assumes that the input arrays are already sorted).
3. Finally we will combine.

## 3 Solution:

Iteration 1 :

Left Hand	Right Hand
5	2
[2,5]	

Iteration 2:

Left hand	Right hand
5	7
2	4

[2,4,5,7]

<b>Iteration 3:</b>	Left Hand	Right Hand
	3	6
	1	2

[1,2,3,6]

<b>Iteration 4:</b>	Left Hand	Right hand
	7	6
	5	3
	4	2
	2	1

[1,2,2,3,4,5,6,7]