

1. Why Merge Sort: Time Complexity -  $O(N \log N)$
2. Merge Sort Theory: Recursive Algorithm, Dividing every time by half elements
3. Merge Sort Complexity: Works like Binary tree, so  $O(\log n)$  & for merge every level,  $O(n/2 + n/2) = O(n)$
4. Merge Sort Implementation
5. Quick Sort Theory: Recursive Algorithm. Dividing 2 side by picking random number [**Pivot Element**] by its left & right side.  
*Choosing Pivot Element impact the time complexity.*

Time Complexity:

**Merge Sort and Quick Sort are called = Divide & Conquer Algorithm**