**Day 6 :**

**30 June – 2024**

**Data Structure**

Merge sort : Merge sort is an efficient sorting technique for large data set. Because this sorting technique follow divided and conquer paradigm or rules.

It works by dividing the input data or items into two parts or halves, and sorting each half part (ie left and right ) recursively and then merge the sorted data set is final data-set (left and right) and produce sorted output.

Quick sort :Quick sort is an efficient sorting technique for large data set. Because this sorting technique follow divided and conquer paradigm or rules with pivot element or data.

It works by selecting a pivot index or pivot element from the array and partitioning the other elements into two sub-list base upon whether the element is less than pivot element or greater than pivot elements.

Pivot element selection we can use different concept.

It may be first element, last element or mid elements or random element.

Searching : this technique is use to search the element present or not in array.

Linear search : this also known sequential search it search each elements from a array using index position. All those elements can be unorder or order (sorted).

Binary search : in this technique we use divide and conquer rules to search the elements from the array. This technique only use for sorted array ie can be asc or desc order.

3,2,6,1,8,9,5,7,4,

3,2,6,1

3,2,

6,1

8,9,5,7,4,

1,2,3,4,

5,

6,7,8,9

Merge Sort Vs Quick Sort

1. In Quick sort we use pivot element to divided our element in left array and right array. Pivot element can be first, last, middle or random number. In Merge sort we divide base upon mid and merge in empty array.
2. In quick sort we are doing partitioning base upon pivot element. In merge sort divide the array into two halve without any comparison between any elements.
3. Stability : Quick sort it not stable. Because of pivot element. Merge sort is disable

Average case for both O( n log n)