**Day 5:**

Sorting technique

What type of data we store in container.

Data size

Time complexity and extra space to hold the data.

Bubble sort: Bubble sort is a simple comparing – based sorting algorithms.

It repeatedly step through the list of sorted data, compared each pair of adjacent item or data and swap them if they are in wrong position.

Selection sort : it is an another simplest sorting technique. It works by dividing the input list or array into two parts.

1st is unsorted element or data

2nd is sorted elements or data

Initially the sorted sub list is empty. While the unsorted sub list contains all elements or data.

1. Find the minimum element. Iterate through unsorted sub list to find the smallest or largest depending upon Asc/des element.
2. If condition true swap with first unsorted element. Swap this min or max with first element of the unsorted sub list.

Insertion sort

Merge sort

Heap sort

Merge sort : Merge sort is an efficient, comparing base sorting technique.

Merge sort use divided – conquer rule. It works by dividing the input into two part or halves, sorting each half recursively and then merge the sorted array or halves to produce a sorted array or final output.

**Time complexity:** time taken to get the output.

Best case:

Worst case:

Average case:

Best case (Omega notation : : the minimum time the algorithms taken with input is favorable.

Worst case (Big O notation ) :O : the maximum time the algorithm taken with input as unfavorable.

Average case ( Theta notation ) : the expected runtime for random input.

Searching :

1. Linear search : this algorithms search target elements from an array one by one.
2. Binary search : binary search is a fast algorithms for finding the target elements from sorted array. It works by repeatedly dividing the search range in half. Eliminating half of the remaining element at each step.

100

50 50

25 25