

## Week - 13 - DSA I

- Data Structure ✓
- Algorithms ✓
- memory allocation ✓
- memory leak ✓
- complexity analysis ✓
- asymptotic analysis ✓
- Big-O notation ✓
- Concepts of array ✓
- Concepts of linked list ✓ (set, insert, delete, init)
- Singly linked list ✓
- Doubly linked list ✓
- concepts of string ✓
- Binary search ✓
- Linear search ✓
- Recursion ✓ (string reverse)
- application of all structures ✓
- Linear vs non-Linear ✓
- + types of ds ✓
- types of memory allocation ✓
- ✓ Contiguous and non contiguous
- ✓ Garbage collection and working
- ✓ adv and disadv of linked list
- ✓ mutable and immutable
- hierarchical DS
- Tagged array.
- adv and disadv of recursion
- List functions.
- virtual memory.
- ✓ circular reference.
- ✓ heterogeneous array.
- ✓ sort, ascending (find middle), descending, linked list, Reverse doubly.
- null termination.
- LF, CR LF
- ✓ unique.

## Week 14 . Data structure II

- ✓ Bubble sort  $O(n^2)$
  - ✓ Insertion sort  $O(n^2)$
  - ✓ Selection sort  $O(n^2)$
  - ✓ Quick sort  $O(n \log n)$ ,  $O(n^2)$
  - ✓ Merge sort  $O(n \log n)$
  - ✓ Stack (types) adv/dis
  - ✓ Queue (types) adv/dis
  - ✓ Push and pop in stack
  - ✓ Enqueue, Dequeue in Queue
  - ✓ Hash tables
  - ✓ Applications all structures
  - ✓ Peek
  - ✓ Stable and unstable
  - ✓ deterministic and undeterministic
  - ✓ Stack underflow and stack overflow
  - ✓ divide and conquer strategy.
  - ✓ adv & dis using stack and queue.
  - ✓ double ended queue.
  - ✓ Hash Functions.
  - ✓ Hash values.
  - ✓ collision.
  - ✓ method to prevent collision.
  - ✓ chaining
  - ✓ linear probing
  - ✓ Quadratic, &
  - ✓ double hashing
  - ✓ Load factor.
  - ✓ array vs hashtable
  - ✓ adv and disadv of hashtable
  - ✓ ~~Stack~~ Bubble sort conditions
  - ✓ Lifo queue
  - ✓ Priority queue
- ### Practicals

  - ✓ reverse string in stack
  - ✓ find long char in string
  - ✓ String Reverse using stack
  - ✓ "aabcdbbefgccc" output: a:1, b:4, c:3
  - ✓ stack second largest
  - ✓ frequency of string using hash map.
  - ✓ delete middle element of stack
  - ✓ valid parenthesis {([)]}
  - ✓ queue reverse in recursion.
  - ✓ find duplicates using hash table