Week-13 - DSA I

- Data structure
- Algorithms
- memory allocation
- memory leak
- complexity analysis
- Asymptotic anylisis
- Big-O-notation
- Concepts of array
- Concepts of linked List (set, insert, Delete, init, get)
- 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

- Contigous and non contigous
- Garbage collection and working
- adv and disadv of Linked list
- mutable and immutable
- hirarchal DS
- Tagged array.
- adv and disadv of recursion
- List functions.
- virtual memory.
- circular reference.
- heterogeneous arrays.
- sort (find middle)
  - accending
  - desending
  - string → linked
  - Reverse doubly.
- null terminator.
- LF, CRLF
- Unicode.

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. $O(\log n)$
- Stack (types) adv/dis
- Queue. (type) adv/dis
- Push and pop in stack
- Enque, Deque in Ques.
- Hash tables
- Applications all structures
- Peek
- Stable and unstable
- deterministic and undeterministic
- Stack underflow and stack overflow
- divide and conquer strategy.
- adv LL using stack and Que.
- double ended Que.
- Hash functions.
- Hash value.
- collision.

- method to prevent collision.
- chaining
- linear probing
- Quadratic, d
- double hashing
- load factor.
- array vs hash table
- adv and diadv of Hash table
- ~~Stack~~ BUBble sort conditions
- Lifo Que
- priority Que

Practicals

* reverse string in stack
* ~~Find~~ long char in string
* String Reverse using stack

* "aabcdbbefgccc
odd a:1, b:1, c:1
* Stack second alarge
* Frequency of string using Hash map.

* delete middle element of stack
* Valid parantheses ([{}])
* que reverse in recursion.
* find duplicates using hash table