

## Assignment - 02

### Data Structures

1. Implement a linked list to create and manage a set of elements. Set of elements contains integer values i.e.  $S = \{4,5,6\}$ . Also implement a method which shows all possible subsets of the created set by user i.e.  $\{\{4\}, \{5\}, \{6\}, \{4,5\}, \{4,6\}, \{5,6\}, \{4,5,6\}, \{\emptyset\}\}$ .
2. Implement a program to generate a linked list. For any unsorted linked list, write a method that will delete any duplicates from the linked list without using a temporary buffer.
3. Implement a program for Merging two sorted linked lists. Collect 20 integers from the command line and divide them equally into two unsorted lists as input.
4. Write a program to find the middle element of a singly linked list in one pass. Collect 30 integers from the command line as unsorted list input.
5. Write a program to collect a weighted undirected graph as input from the user. Find MST using Prim's Algorithm. [You can directly scan adjacency list/ matrix from user]
6. Write a program to collect a weighted undirected graph as input from the user. Find MST using Krushkal's Algorithm. [You can directly scan adjacency list/ matrix from user]
7. Write a program to collect a weighted directed graph as input from the user. Find shortest path from source vertex entered by user to all other vertices. [You can directly scan adjacency list/ matrix from user]

Note: for problem 5,6 and 7 also include the graph considered for calculation.