Data Structures an Applications

Linked Lists

1. What are the advantages and disadvantages of representing a group of items as an array versus a linear linked lists.
2. Write a c program to reverse the elements of a given linked lists.
3. Explain the various operations on a singly linked list. (insert, delete, display)
4. What is doubly linked list, circular linked list? Pseudocode or an algorithm for various operations on both. What are the advantages and disadvantages of both.
5. How can a polynomial in 2 variables (x and y) be represented by singly linked list? Each node should represent a term and should contain powers of x and y, as well as coefficient of the same. Write a c program to evaluate given polynomial for given values of x and y.
6. Draw and explain the representation of sparse matrix of order mxn using linked lists.
7. Mention the different uses of header node.
8. Implementation of stack and queues using singly linked list.
9. Implementation of stack and queues using doubly linked list.
10. Implementation of stack and queues using circular linked list.
11. Write an algorithm to perform the following operations.
    i. Combine 2 ordered lists into a singly linked list. (merge sort)
    ii. Form a list containing the union of the elements of two lists.
    iii. Form a list containing the intersection of the elements of two lists
    iv. Make a second copy of a list.
    v. Remove the duplicate element of the list
    vi. Write a c function **search(l,x)** that accepts a pointer ‘l’ to a list of integers and an integer x and returns a pointer to a node containing x, if it exists and the null pointer otherwise. Write another function srchinsrt(l,x), that adds ‘x’ to ‘l’ if it is not found and always returns a pointer to a node containing ‘xs’.
12. Concatenation of linked list. Explain with pseudocode for singly, doubly and circular.