

**Shri Swaminarayan College of Computer Science**  
**SY BCA: Data Structure**

**Lab Assignment: 5**

**Topic: LINK LIST**

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**Assignment date 20-9-2009**

**Submission date 4-10-2009**

1. Write a program to implement single link list to implement the following basic operations.
  - a. Create
  - b. Insert
    - i. At beginning
    - ii. At last position
    - iii. At specified position
    - iv. Before the search element
    - v. After the search element
  - c. Delete
    - i. The first node
    - ii. The last node
    - iii. The search node
    - iv. The node at the specified position
  - d. Edit
    - i. The node at specified position
    - ii. The node with the search element
  - e. Display
  - f. Search the particular node occurring the total number of times
  - g. Count the total no of nodes in list
2. Write a program to concatenate one list at the end of the other
3. Write a program to splitting a list in to two.
4. Write a program to copy one list into other.
5. Write a program to remove the first node of the list and insert it at the end.
6. Write a program to remove the last node of the list and insert it at the beginning
7. Write a program to swap the first and the last element of a link list
  - a. By exchanging data part
  - b. Through pointer
8. Write a program to swap the  $m^{\text{th}}$  and  $n^{\text{th}}$  element of the list.
9. Write a program to swap the  $m$  and  $m+1$  element of the list

- a. By exchanging data part
  - b. Through pointer
10. Write a program to count non-zero elements, odd numbers and even numbers in a list
  11. Write a program to find the largest and smallest element of a list, print total of all the elements and find out the average.
  12. Write a program to create list L1, remove all the nodes having even number in data part from list L1 and add into list L2 and all the nodes having odd number in list L3.
  13. Write a program to construct a link list in which each node has the Roll\_no, name and marks of 3 subjects information about a student. Enter the records of 10 students in list. Traverse the list and calculate the total marks in three subjects, percentages and class of each student. Count how many students have 1<sup>st</sup> class, 2<sup>nd</sup> class, pass class and fail.
  14. Given two sorted link lists, merge them into third sorted link list, if an element is present in both the list, it should occur only once in the third list.
  15. Write a program to create a link list with given number in which data part of each node contain the digit of this number. For example, if the number is 43215 then five nodes should be created with data part contain 4,3,2,1,5.
  16. Write a program to delete all the nodes with the value N.
  17. Write a program to implement single circular link list to implement the following basic operations.
    - a. Create
    - b. Insert
      - i. At beginning
      - ii. At last position
      - iii. At specified position
      - iv. Before the search element
      - v. After the search element
    - c. Delete
      - i. The first node
      - ii. The last node
      - iii. The search node
      - iv. The node at the specified position
    - d. Edit
      - i. The node at specified position
      - ii. The node with the search element
    - e. Display

- f. Search the particular node occurring the total number of times
- g. Count the total no of nodes in list

18. Write a program to implement doubly link list to implement the following basic operations.

- a. Create
- b. Insert
  - i. At beginning
  - ii. At last position
  - iii. At specified position
  - iv. Before the search element
  - v. After the search element
- c. Delete
  - i. The first node
  - ii. The last node
  - iii. The search node
  - iv. The node at the specified position
- d. Edit
  - i. The node at specified position
  - ii. The node with the search element
- e. Display
- f. Search the particular node occurring the total number of times
- g. Count the total no of nodes in list

19. Write a program to implement doubly circular link list to implement the following basic operations.

- a. Create
- b. Insert
  - i. At beginning
  - ii. At last position
  - iii. At specified position
  - iv. Before the search element
  - v. After the search element
- c. Delete
  - i. The first node
  - ii. The last node
  - iii. The search node
  - iv. The node at the specified position
- d. Edit
  - i. The node at specified position
  - ii. The node with the search element
- e. Display
- f. Search the particular node occurring the total number of times
- g. Count the total no of nodes in list

20. Write a program to maintain a sorted linked list in descending order.