Program 6

Linked list :- Singly linked list

Algorithm for Singly Linked List

Node Creation:-

```
Struct node
{
   int data;
   Struct node *next;
};
struct node *head, *ptr;
ptr = (struct node *) malloc (sizeof (struct node *));
```

Insertion:-

① Insertion at the beginning

```
if ptr = NULL
    Print overflow
    End of if
set New_Node = ptr
set ptr = ptr -> next
    new_Node -> data = val
    New_Node -> Next = head
    Set Head = New_Node
    Exit
```

② Insertion at the Last

```
if ptr = NULL   Print OVERFLOW
    end if
new_node = ptr
    ptr = ptr -> next
    newnode -> data = val
    new_node -> next = NULL
    set ptr = head
    while ptr -> next = NULL
        se ptr = ptr -> Next
                                end Loop
```

```
Ptr -> next = new_node
exit
```

3. Insertion after the random location:-

```
if Ptr = NULL
    Print OVERFLOW
    Exit
    end of if
new_node = ptr
new_node -> data = val
Temp = head
I = 0
Repeat
        i=0 until i
temp = temp -> next
if temp = NULL
    write " Desired node not present"
    exit
    end of if
end of loop
Ptr -> next = Temp -> Next
Temp -> Next = Ptr
Ptr = new_node
exit
```

Deletion:

① Deletion at beginning

```
if head = NULL
    Print UNDERFLOW
        exit
    end of if
Ptr = head
head = head -> next
free ptr
exit
```

② Deletion at the last

```
if head = NULL
    Write UNDERFLOW
        exit
    end of if
Ptr = head
Repeat next 2 steps while ptr -> next != NULL
    Preptr = ptr
    Ptr = ptr -> next
end of Loop
PrePtr -> next = NULL
free ptr
exit
```

(3)

```
if head = NULL
    Print Underflow
        exit
    end of if
    temp = head
        i = 0
    Repeat Until i
        temp1 = temp
        temp = temp -> next
        if tem = " NULL "
            print " Desired value not present "
            exit
            end of if
        i = i + 1
    end of loop
    temp1 -> next = Temp -> next
        free temp
        exit
```

Seasching in Singly Linked list:

```
ptr = head
    i = 0
if ptr = NULL
    Print " Empty List "
        exit
    end of if
Repeat until ptr != NULL
    if ptr -> data = item
        write i+1
        end of if
    i = i+1
    ptr = ptr -> next
    end of Loop
    exit
```

display :-

```
ptr = head
  ptr = NULL
    print "Empty list"
    exit
  end of if
Repeat until ptr != NULL
  print ptr -> data
       ptr = ptr -> next
  end of loop
  exit
```