S.No: 6	Exp. Name: ***C program to performs all operations on singly linked list***	Date:2024-05-13

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Aim:

Write a program that uses functions to perform the following **operations on singly linked list**

i) Creation

ii) Insertion

iii) Deletion

iv) Traversal

Source Code:

singlelinkedlistalloperations.c

```
#include<stdio.h>
#include<stdlib.h>

struct node{
   int data;
   struct node *next;
};

struct node *head = NULL, *temp;

void insert()
{
   int el;
   printf ("Enter elements for inserting into linked list : ");
   scanf("%d",&el);
   struct node *new = (struct node *)malloc(sizeof(struct node));
   new -> data = el;new -> next = NULL;
   if (head == NULL) head = new;
else{
   temp = head;
      while (temp -> next != NULL) temp = temp -> next;
         temp -> next = new;
      }
}
void rem(){
   int pos, count; temp = head;
   printf("Enter position of the element for deleteing the element : ");
   scanf("%d",&pos);
   if (pos == 1){
      head = head -> next;
      printf("Deleted successfully\n");
}else{
   for(count = 2; count < pos; count++) temp = temp -> next;
      temp -> next = temp -> next -> next;
      printf("Deleted successfully\n");
      }
   }
void display()
{
   temp=head;
   printf("The elements in the linked list are : ");
   while(temp !=NULL){
```

```
      printf("%d ",temp -> data);
      temp = temp->next;
   }printf("\n");
}
void count(){
   int count=0; temp = head;
   while(temp != NULL){
      temp = temp -> next;
      count++;
}printf ("No of elements in the linked list are : %d\n", count);
}

void main(){
   int op;
   printf("Singly Linked List Example - All Operations\n");
   while (1){
      printf("Options\n");
      printf("1 : Insert elements into the linked list\n");
      printf("2 : Delete elements from the linked list\n");
      printf("3 : Display the elements in the linked list\n");
      printf("4 : Count the elements in the linked list\n");
      printf("5 : Exit()\n");
      printf("Enter your option : "); scanf("%d", &op);
      switch(op){
         case 1: insert(); break;
         case 2: rem(); break;
         case 3: display(); break;
         case 4: count(); break;
         case 5: printf("\n"); exit(0);
         default: printf("Invalid option\n");
      }
   }
}
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Singly Linked List Example - All Operations 1
Options 1
1 : Insert elements into the linked list 1
2 : Delete elements from the linked list 1
3 : Display the elements in the linked list 1
4 : Count the elements in the linked list 1
5 : Exit() 1
Enter your option : 1
Enter elements for inserting into linked list : 111
Options 1
1 : Insert elements into the linked list 1
2 : Delete elements from the linked list 1
3 : Display the elements in the linked list 1
4 : Count the elements in the linked list 1
5 : Exit() 1

```
Enter your option :  1
Enter elements for inserting into linked list :  222
Options 1
1 : Insert elements into the linked list 1
2 : Delete elements from the linked list 1
3 : Display the elements in the linked list 1
4 : Count the elements in the linked list 1
5 : Exit() 1
Enter your option :  1
Enter elements for inserting into linked list :  333
Options 1
1 : Insert elements into the linked list 1
2 : Delete elements from the linked list 1
3 : Display the elements in the linked list 1
4 : Count the elements in the linked list 1
5 : Exit() 1
Enter your option :  1
Enter elements for inserting into linked list :  444
Options 3
1 : Insert elements into the linked list 3
2 : Delete elements from the linked list 3
3 : Display the elements in the linked list 3
4 : Count the elements in the linked list 3
5 : Exit() 3
Enter your option :  3
The elements in the linked list are : 111 222 333 444  2
Options 2
1 : Insert elements into the linked list 2
2 : Delete elements from the linked list 2
3 : Display the elements in the linked list 2
4 : Count the elements in the linked list 2
5 : Exit() 2
Enter your option :  2
Enter position of the element for deleteing the element :  2
Deleted successfully 3
Options 3
1 : Insert elements into the linked list 3
2 : Delete elements from the linked list 3
3 : Display the elements in the linked list 3
4 : Count the elements in the linked list 3
5 : Exit() 3
Enter your option :  3
The elements in the linked list are : 111 333 444  4
Options 4
1 : Insert elements into the linked list 4
2 : Delete elements from the linked list 4
3 : Display the elements in the linked list 4
4 : Count the elements in the linked list 4
5 : Exit() 4
Enter your option :  4
No of elements in the linked list are : 3 5
```

Options 5
1 : Insert elements into the linked list 5
2 : Delete elements from the linked list 5
3 : Display the elements in the linked list 5
4 : Count the elements in the linked list 5
5 : Exit() 5
Enter your option : 5

Test Case - 2
User Output
Singly Linked List Example - All Operations 1
Options 1
1 : Insert elements into the linked list 1
2 : Delete elements from the linked list 1
3 : Display the elements in the linked list 1
4 : Count the elements in the linked list 1
5 : Exit() 1
Enter your option : 1
Enter elements for inserting into linked list : 001
Options 1
1 : Insert elements into the linked list 1
2 : Delete elements from the linked list 1
3 : Display the elements in the linked list 1
4 : Count the elements in the linked list 1
5 : Exit() 1
Enter your option : 1
Enter elements for inserting into linked list : 010
Options 1
1 : Insert elements into the linked list 1
2 : Delete elements from the linked list 1
3 : Display the elements in the linked list 1
4 : Count the elements in the linked list 1
5 : Exit() 1
Enter your option : 1
Enter elements for inserting into linked list : 100
Options 1
1 : Insert elements into the linked list 1
2 : Delete elements from the linked list 1
3 : Display the elements in the linked list 1
4 : Count the elements in the linked list 1
5 : Exit() 1
Enter your option : 1
Enter elements for inserting into linked list : 101
Options 3
1 : Insert elements into the linked list 3
2 : Delete elements from the linked list 3
3 : Display the elements in the linked list 3
4 : Count the elements in the linked list 3
5 : Exit() 3
Enter your option : 3

```
The elements in the linked list are : 1 10 100 101  2
Options 2
1 : Insert elements into the linked list 2
2 : Delete elements from the linked list 2
3 : Display the elements in the linked list 2
4 : Count the elements in the linked list 2
5 : Exit() 2
Enter your option :  2
Enter position of the element for deleteing the element :  3
Deleted successfully 3
Options 3
1 : Insert elements into the linked list 3
2 : Delete elements from the linked list 3
3 : Display the elements in the linked list 3
4 : Count the elements in the linked list 3
5 : Exit() 3
Enter your option :  3
The elements in the linked list are : 1 10 101  4
Options 4
1 : Insert elements into the linked list 4
2 : Delete elements from the linked list 4
3 : Display the elements in the linked list 4
4 : Count the elements in the linked list 4
5 : Exit() 4
Enter your option :  4
No of elements in the linked list are : 3 5
Options 5
1 : Insert elements into the linked list 5
2 : Delete elements from the linked list 5
3 : Display the elements in the linked list 5
4 : Count the elements in the linked list 5
5 : Exit() 5
Enter your option :  5
```