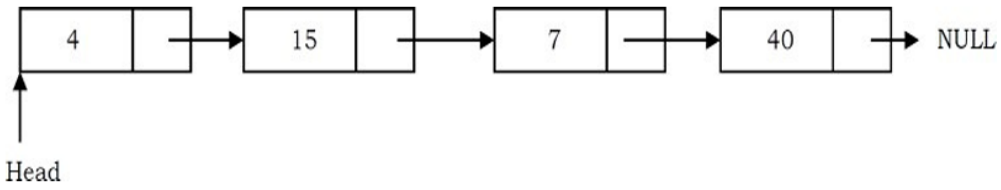
singlely linked list

Write a program to implement the operations of a singly linked list.

Prerequisite: Basic Knowledge and operations of a Singly Linked list.

Description: A linked list is a data structure used for storing collections of data. This list consists of a number of nodes of which each node has a next pointer to the following element. The link of the last node in the list is NULL, which indicates the end of the list.



Program:

```
#include<stdio.h>
#include<stdlib.h>
struct node{
   int data;
   struct node *next;
};
struct node *head=NULL;
void create(){
   struct node *nn,*temp;
   nn=(struct node*)malloc(sizeof(struct node));
   printf("enter the value");
scanf("%d",&nn->data);
   nn->next=NULL;
   if(head==NULL){
      head=nn;
   }
   else{
```

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        temp=head;
        while(temp->next!=NULL){
            temp=temp->next;
        }
        temp->next=nn;
    }
}
void insertbeg(){
    struct node *nn,*temp;
    nn=(struct node*)malloc(sizeof(struct node));
    printf("enter the value");
scanf("%d",&nn->data);
    nn->next=NULL;
    if(head==NULL){
        head=nn;
    }
    else{
        nn->next=head;
        head=nn;
    }
}
void insertspe(){
    struct node *nn,*temp;
    int pos,i;
    nn=(struct node*)malloc(sizeof(struct node));
    printf("enter the value");
scanf("%d",&nn->data);
    nn->next=NULL;
    if(head==NULL){
        head=nn;
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    }
    else{
    temp=head;
    printf("enter the position where you want to insert\n");
    scanf("%d",&pos);
    if(pos==0){
        nn->next=head;
        head=nn;
        return;
    }
    for( i=0;i<pos-1&&temp!=NULL;i++){
        temp=temp->next;
    }
    if(temp==NULL){
        printf("you have entered wrong position\n");
        return;
    }
    nn->next=temp->next;
    temp->next=nn;
}
}

void insertlast(){
      create();
  }
void deletebeg(){
    struct node *temp;
    if(head==NULL){
        printf("there is no node formed\n");
    }
```

```
    else{
        temp=head;
        head=temp->next;
        free(temp);
    }
}
void deleteend(){
    struct node *temp1,*temp2;
    if(head==NULL){
        printf("there is no node formed\n");
    }
    else{
        temp1=head;
        if(temp1->next==NULL){
            head=temp1->next;
            free(temp1);
        }
        while(temp1->next!=NULL){
            temp2=temp1;
            temp1=temp1->next;
        }
    temp2->next=temp1->next;
    free(temp1);
        }
}
void deletespe(){
    struct node *temp1,*temp2;
    int pos,i;
    if(head==NULL){
        printf("there is no node formed\n");
```

```
    }
    else{
        temp1=head;
 printf("enter the position where you want to delete\n");
    scanf("%d",&pos);
    if(pos==0){
        head=temp1->next;
        free(temp1);
      return;
    }
        for(i=0;i<pos&&temp1!=NULL;i++){
            temp2=temp1;
            temp1=temp1->next;
        }
        if(temp1==NULL){
            printf("you have entered wrong position\n");
            return;
        }
        temp2->next=temp1->next;
        temp1->next=NULL;
        free(temp1);
    }
}
void display(){
    struct node *temp;
    if(head==NULL){
        printf("there is no nodes formed\n");
    }
    else{
      temp=head;
```

```
      while(temp!=NULL){
         printf("%d\n",temp->data);
         temp=temp->next;
      }
   }
}
void search(){
   struct node *temp;
   int key,found=0;
   printf("enter key");
   scanf("%d",&key);
    if(head==NULL){
      printf("there is no node formed\n");
      }
   else{
      temp=head;

   while(temp!=NULL){
      if(temp->data==key){
         found=1;
      }
      temp=temp->next;
       }
       if(found==1){
          printf("element is found in the list\n");
       }
          else{
             printf("element is not found in the list\n");
          }
       }
```

```
}
int main(){
   int choice;
   int nodes,i;
   printf("1.create\n2.insert at begining\n3.insert at specific position\n4.insert at end\n5.delete at begining\n6.delete at specific position\n7.delete at end\n 8.search\n9.display\n10.exit\n");
   while(1){
      printf("enter choice");
      scanf("%d",&choice);
      switch(choice){
         case 1: printf("enter no of nodes you want to create");
   scanf("%d",&nodes);
                for( i=0;i<nodes;i++){
                     create();
                     }
                break;
         case 2:insertbeg();
               break;
         case 3:insertspe();
               break;
         case 4:insertlast();
               break;
         case 5:deletebeg();
               break;
         case 6:deletespe();
               break;
         case 7:deleteend();
               break;
         case 8:search();
               break;
```

```
        case 9:display();
               break;
        case 10:printf("exiting....");
                display();
               return -1;
        default:printf("invalid choice");
               break;
      }
   }
   return 0;
}
```