***Assignment No. 9***

Perform following operations on SLL (singly linked list) and perform operations

a) Insert (at front, at end, in the middle)

b) Delete (at front, at end, in the middle)

c) Print SLL

d) Reverse

Roll No.66

Batch: - S3

#include<stdio.h>

#include<stdlib.h>

typedef struct node

{ int data;

struct node \*next;

}node;

node \*create();

node \*insert\_b(node \*head,int x);

node \*insert\_e(node \*head,int x);

node \*insert\_in(node \*head,int x);

node \*delete\_b(node \*head);

node \*delete\_e(node \*head);

node \*delete\_in(node \*head);

node \*reverse(node \*head);

void search(node \*head);

void print(node \*head);

void printreverse(node \*head);

void main()

{ int ch,ch1,x;

node \*head=NULL;

do

{

printf("\n\n1)create\n2)Insert\n3)Delete ");

printf("\n4)Reverse\n5)Print\n6)Quit");

printf("\nEnter your Choice:");

scanf("%d",&ch);

switch(ch)

{

case 1: head=create();

break;

case 2: printf("\nEnter the data to be inserted : ");

scanf("%d",&x);

printf("\n\t1)Beginning\n\t2)End\n\t3)In between");

printf("\nEnter your choice : ");

scanf("%d",&ch1);

switch(ch1)

{ case 1: head=insert\_b(head,x);

break;

case 2: head=insert\_e(head,x);

break;

case 3: head=insert\_in(head, x);

break;

}

break;

case 3:printf("\n\t1)Beginning\n\t2)End\n\t3)In between");

printf("\nEnter your choice : ");

scanf("%d",&ch1);

switch(ch1)

{ case 1:head=delete\_b(head);

break;

case 2:head=delete\_e(head);

break;

case 3:head=delete\_in(head);

break;

}

break;

case 4:head=reverse(head);

print(head);

break;

case 5:print(head);

break;

case 6:exit(0);

default:printf("Invalid Choice");

break;

}

}while(ch!=7);

}

void printreverse(node \*head)

{

if(head !=NULL)

{

printreverse(head->next);

printf("%d ",head->data);

}

}

node \*create()

{

node \*head,\*p;

int i,n;

head=NULL;

printf("\n Enter no of data:");

scanf("%d",&n);

printf("\nEnter the data:");

for(i=0;i<n;i++)

{

if(head==NULL)

p=head=(node\*)malloc(sizeof(node));

else

{

p->next=(node\*)malloc(sizeof(node));

p=p->next;

}

p->next=NULL;

scanf("%d",&(p->data));

}

return(head);

}

node \*insert\_b(node \*head,int x)

{ node \*p;

p=(node\*)malloc(sizeof(node));

p->data=x;

p->next=head;

head=p;

return(head);

}

node \*insert\_e(node \*head,int x)

{ node \*p,\*q;

p=(node\*)malloc(sizeof(node));

p->data=x;

p->next=NULL;

if(head==NULL)

return(p);

for(q=head;q->next!=NULL;q=q->next);

q->next=p;

return(head);

}

node \*insert\_in(node \*head,int x)

{ node \*p,\*q;

int y;

p=(node\*)malloc(sizeof(node));

p->data=x;

p->next=NULL;

printf("\nInsert after which number ? : ");

scanf("%d",&y);

for(q=head ; q != NULL && q->data != y ; q=q->next);

if(q!=NULL)

{

p->next=q->next;

q->next=p;

}

else

printf("\nData not found ");

return(head);

}

node \*delete\_b(node \*head)

{

node \*p,\*q;

if(head==NULL)

{

printf("\nLinked List is Empty");

return(head);

}

p=head;

head=head->next;

free(p);

return(head);

}

node \*delete\_e(node \*head)

{

node \*p,\*q;

if(head==NULL)

{

printf("\nLinked List is Empty");

return(head);

}

p=head;

if(head->next==NULL)

{

head=NULL;

free(p);

return(head);

}

for(q=head;q->next->next !=NULL;q=q->next)

;

p=q->next;

q->next=NULL;

free(p);

return(head);

}

node \*delete\_in(node \*head)

{

node \*p,\*q;

int x,i;

if(head==NULL)

{

printf("\nLinked List is Empty");

return(head);

}

printf("\nEnter the data to be deleted : ");

scanf("%d",&x);

if(head->data==x)

{

p=head;

head=head->next;

free(p);

return(head);

}

for(q=head;q->next->data!=x && q->next !=NULL;q=q->next )

;

if(q->next==NULL)

{

printf("\nData not found");

return(head);

}

p=q->next;

q->next=q->next->next;

free(p);

return(head);

}

void print(node \*head)

{ node \*p;

printf("\n\n");

for(p=head;p!=NULL;p=p->next)

printf("%d ",p->data);

}

node \*reverse(node \*head)

{ node \*p,\*q,\*r;

p=NULL;

q=head;

r=q->next;

while(q!=NULL)

{

q->next=p;

p=q;

q=r;

if(q!=NULL)

r=q->next;

}

return(p);

}

-----------OUTPUT----------

1)create

2)Insert

3)Delete

4)Reverse

5)Print

6)Quit

Enter your Choice:1

Enter no of data:5

Enter the data:1

3

5

6

8

1)create

2)Insert

3)Delete

4)Reverse

5)Print

6)Quit

Enter your Choice:2

Enter the data to be inserted : 13

1)Beginning

2)End

3)In between

Enter your choice : 1

1)create

2)Insert

3)Delete

4)Reverse

5)Print

6)Quit

Enter your Choice:5

13 1 3 5 6 8

1)create

2)Insert

3)Delete

4)Reverse

5)Print

6)Quit

Enter your Choice:3

1)Beginning

2)End

3)In between

Enter your choice : 1

1)create

2)Insert

3)Delete

4)Reverse

5)Print

6)Quit

Enter your Choice:5

1 3 5 6 8

1)create

2)Insert

3)Delete

4)Reverse

5)Print

6)Quit

Enter your Choice:4

8 6 5 3 1

1)create

2)Insert

3)Delete

4)Reverse

5)Print

6)Quit

Enter your Choice:5

8 6 5 3 1

1)create

2)Insert

3)Delete

4)Reverse

5)Print

6)Quit

Enter your Choice:6