数据结构实验二

余健明

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201930310050

#include<string.h>

#include<ctype.h>

#include<malloc.h> /\* malloc()等 \*/

#include<limits.h> /\* INT\_MAX等 \*/

#include<stdio.h> /\* EOF(=^Z或F6),NULL \*/

#include<stdlib.h> /\* atoi() \*/

#include<io.h> /\* eof() \*/

#include<math.h> /\* floor(),ceil(),abs() \*/

#include<process.h> /\* exit() \*/

#define TRUE 1

#define FALSE 0

#define OK 1

#define ERROR 0

#define INFEASIBLE -1

typedef int ElemType;

typedef int Status;

typedef int Boolean;

typedef struct myNode

{

ElemType data;

struct myNode\* next;

} Node;

typedef Node\* LinkList;

Status InitList(LinkList \*L)

{

\*L = (LinkList)malloc(sizeof(Node));

if(!(\*L))

exit(OVERFLOW);

(\*L)->next = NULL;

return OK;

}

Status ClearList(LinkList \*L) {

LinkList pre, p;

if(!(\*L))

{

return ERROR;

}

pre = (\*L)->next;

while (pre)

{

p=pre->next;

free(pre);

pre=p;

}

return OK;

}

Status DestroyList(LinkList \*L)

{

LinkList p = \*L;

while (p)

{

p=(\*L)->next;

free(\*L);

(\*L) = p;

}

return OK;

}

Status ListEmpty(LinkList L)

{

if(L!=NULL && L->next==NULL)

return OK;

else

return ERROR;

}

Status ListLength(LinkList L)

{

LinkList p;

int i;

if(L)

{

i=0;

p = L->next;

while (p)

{

i++;

p = p->next;

}

}

return i;

}

Status GetEle(LinkList L,int i,ElemType \*e)

{

int j;

LinkList p = L->next;

j=1;

p=L->next;

while (p && j<i)

{

j++;

p=p->next;

}

if(!p || j>i)

return ERROR;

\*e = p->data;

return OK;

}

Status LocateElem(LinkList L,ElemType e) //找到元素

{

int i = 0;

LinkList p = L->next;

while(p)

{

i++;

if(p->data == e)

p = p->next;

else

break;

}

return i;

}

Status PriorElem(LinkList L, ElemType cur\_e, ElemType \*prior\_e)

{

LinkList p, p1;

if(L)

{

p = L->next;

while(p)

{

p1 = p->next;

if(p1->data == cur\_e)

{

\*prior\_e = p1->data;

return OK;

}

p = p->next;

}

return ERROR;

}

else

return ERROR;

}

Status NextElem(LinkList L, ElemType cur\_e, ElemType \*next\_e)

{

LinkList p, p1;

if(L)

{

p = L->next;

while(p && p->next)

{

p1 = p->next;

if(p->data == cur\_e)

{

\*next\_e = p1->data;

return OK;

}

p = p->next;

}

return ERROR;

}

else

return ERROR;

}

Status ListInsert(LinkList L,int i, int e)//插入

{

LinkList p,p1;

int j=1;

p = L->next;

while (p && j<i-1)

{

p=p->next;

++j;

}

p1 = (LinkList)malloc(sizeof(Node));

if(!p1)

exit(OVERFLOW);

p1->data = e;

p1->next = p->next;

p->next = p1;

return OK;

}

Status ListDelete(LinkList L,int i,int \*e)//插入删除

{

LinkList p,p1;

int j=1;

p = L->next;

while(p && j<i-1)

{

j++;

p = p->next;

}

if(!(p->next) || j>i-1)

return ERROR;

p1 = p->next;

p->next = p1->next;

\*e = p1->data;

free(p1);

return OK;

}

Status ListTraverse(LinkList L) // 输出

{

LinkList p;

p = L->next;

while(p)

{

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

p = p->next;

}

return OK;

}

void CreatList(LinkList \*L, int n) //调用链表

{

InitList(L);

LinkList p1;

int i;

for(i=n, p1=\*L; i>0; i--)

{

LinkList p;

int a;

scanf("%d", &a);

//ListInsert(\*L, i, a);

p = (LinkList)malloc(sizeof(Node));

p->data = a;

p1->next= p;

p1 = p1->next;

//\*L = p1

//p->next = (\*L)->next;

//(\*L)->next = p;

}

p1->next = NULL;

}

Status MergeList(LinkList La, LinkList \*Lb ,LinkList \*Lc)

{

LinkList p1, p2, p3;

p1 = La->next;

p2 = (\*Lb)->next;

p3 = (\*Lc)->next;

while(p1 && p2)

{

if(p1->data<=p2->data)

{

p3->next = p1;

p3 = p1;

p1 = p1->next;

}

else

{

p3->next = p2;

p3 = p2;

p2=p2->next;

}

}

p3->next = p1?p1:p2;

free(\*Lb);

\*Lb=NULL;

return OK;

}

Status nizhuan(LinkList \*La, LinkList \*Lb){

ElemType i,j,k=1,n=5,m,t,e=0;

LinkList a = \*Lb;

while(a->next!=NULL){

a=(\*Lb)->next;

while (a->next!=NULL)

{

a=a->next;

t=a->data;

}

if(k!=1&&n!=1){

ListInsert(\*La,k,t);

}

ListDelete(\*Lb,n,&e);

n--;

k++;

}

k--;

t=((\*Lb)->next)->data;

ListInsert(\*La,k,t);

return OK;

}

int main()

{

LinkList L1,L2;

CreatList(&L1, 1);

CreatList(&L2, 5);

nizhuan(&L1,&L2);

ListTraverse(L2);

printf("\n");

ListTraverse(L1);

return 0;

}

实验总结：一开始出现输出混乱、并未逆序输出的问题，将程序加上n—解决问题。

ListDelete(\*Lb, n, &e);

n--;

k++;