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DIV-A BATCH-A3  
ROLL NO.- 22558

EXPERIMENT NO-8

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Pr. No : 06

Title : Second year Computer Engineering class, set A of students like Vanilla Ice-cream and set B of stu

dents like butterscotch ice-cream. Write C/C++ program to store two sets using linked

list. compute and display-

i.Set of students who like either vanilla or butterscotch or both

ii.Set of students who like both vanilla and butterscotch

iii. Set of students who like only vanilla not butterscotch

iv.Set of students who like only butterscotch not vanilla

v.Number of students who like neither vanilla nor butterscotch

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#include<iostream>

using namespace std;

struct SLLNode\* createSLL(int cnt, struct SLLNode \*head);

void displaySLL(struct SLLNode \*head);

void A\_U\_B();

void A\_int\_B();

void A\_Min\_B();

void B\_Min\_A();

void U\_Min\_A\_U\_B();

struct SLLNode

{

char data;

struct SLLNode \*next;

}\*headU, \*headA, \*headB;

int main()

{

int i,no;

cout<<"\n\n\t How many Linked Lists: ";

cin>>no;

headU = headA = headB = NULL;

for(i=1; i<=no; i++)

{

if(i == 1)

{

cout<<"\n\n\t Enter 10 Students of SE Comp : ";

headU = createSLL(10, headU);

cout<<"\n";

displaySLL(headU);

}

if(i == 2)

{

cout<<"\n\n\t Enter 5 Students who like Vanilla Icecreme: ";

headA = createSLL(5, headA);

cout<<"\n";

displaySLL(headA);

}

if(i == 3)

{

cout<<"\n\n\t Enter 5 Students who like Butterscotch Icecreme: ";

headB = createSLL(5, headB);

cout<<"\n";

displaySLL(headB);

}

}

cout<<"\n\n Input Sets:------------------------";

cout<<"\n\n Set ’U’: ";

displaySLL(headU);

cout<<"\n\n Set ’A’: ";

displaySLL(headA);

cout<<"\n\n Set ’B’: ";

displaySLL(headB);

cout<<"\n\n Output Sets:------------------------";

A\_U\_B();

A\_int\_B();

A\_Min\_B();

B\_Min\_A();

U\_Min\_A\_U\_B();

cout<<"\n\n";

return 0;

}

//.........................................................Function to create Linked List as Sets.

struct SLLNode\* createSLL(int cnt, struct SLLNode \*head)

{

int i;

struct SLLNode \*p, \*newNode;

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

{

newNode = new(struct SLLNode); // 1. DMA

cout<<"\n\t Enter Student Initial: "; // 2. Data & Address Assignment

cin>>newNode->data;

newNode->next = NULL;

if(head == NULL) // 3. Add node in the list

{

head = newNode;

p = head;

}

else

{

p->next = newNode;

p = p->next;

}

}

return head;

}

//...............................................Function to display Linked Lists as Sets.

void displaySLL(struct SLLNode \*head)

{

struct SLLNode \*p;

p = head;

while(p != NULL)

{

cout<<" "<<p->data;

p = p->next;

}

}

//................................................Function for Set A U B .

void A\_U\_B()

{

int i,j;

char a[10];

struct SLLNode \*p, \*q;

i = 0; //Index of Resultant Array

p = headA; //pointer to Set ’A’

q = headB; //pointer to Set ’B’

while(p != NULL && q != NULL)

{

if(p->data == q->data)

{

a[i] = p->data;

i++;

p = p->next;

q = q->next;

}

else

{

a[i] = p->data;

i++;

p = p->next;

}

}

if(p == NULL) //Set ’A’ copied completely

{

while(q != NULL) //Copy remaining elements of Set ’B’

{

a[i] = q->data;

i++;

q = q->next;

}

}

if(q == NULL) //Set ’B’ copied completely

{

while(p != NULL) //Copy remaining elements of Set ’A’

{

a[i] = p->data;

i++;

p = p->next;

}

}

cout<<"\n\n\t Set A U B: ";

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

cout<<" "<<a[j];

}

//................................................Function for Set A ^ B .

void A\_int\_B()

{

int i,j;

char a[10];

struct SLLNode \*p, \*q;

i = 0; //Index of Resultant Array

p = headA; //pointer to Set ’A’

while(p != NULL)

{

q = headB; //pointer to Set ’B’

while(q != NULL)

{

if(p->data == q->data)

{

a[i] = p->data;

i++;

}

q = q->next;

}

p = p->next;

}

cout<<"\n\n\t Set A ^ B: ";

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

cout<<" "<<a[j];

}

//................................................Function for Set A - B .

void A\_Min\_B()

{

int i,j,flag;

char a[10];

struct SLLNode \*p, \*q;

i = 0; //Index of Resultant Array

p = headA; //pointer to Set ’A’

while(p != NULL)

{

flag = 0;

q = headB; //pointer to Set ’B’

while(q != NULL)

{

if(p->data == q->data)

{

flag = 1;

}

q = q->next;

}

if(flag == 0)

{

a[i] = p->data;

i++;

}

p = p->next;

}

cout<<"\n\n\t Set A - B: ";

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

cout<<" "<<a[j];

}

//................................................Function for Set B - A.

void B\_Min\_A()

{

int i,j,flag;

char a[10];

struct SLLNode \*p, \*q;

i = 0; //Index of Resultant Array

q = headB; //pointer to Set ’B’

while(q != NULL)

{

flag = 0;

p = headA; //pointer to Set ’A’

while(p != NULL)

{

if(q->data == p->data)

{

flag = 1;

}

p = p->next;

}

if(flag == 0)

{

a[i] = q->data;

i++;

}

q = q->next;

}

cout<<"\n\n\t Set B - A: ";

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

cout<<" "<<a[j];

}

//................................................Function for Set U - (A U B).

void U\_Min\_A\_U\_B()

{

int i,j,flag;

char a[10];

struct SLLNode \*p, \*q, \*r;

i = 0; //Index of Resultant Array

p = headU; //pointer to Set ’U’

while(p != NULL)

{

flag = 0;

q = headA; //pointer to Set ’A’

r = headB; //pointer to Set ’B’

while(q != NULL)

{

if(p->data == q->data)

{

flag = 1;

}

q = q->next;

}

while(r != NULL)

{

if(p->data == r->data)

{

flag = 1;

}

r = r->next;

}

if(flag == 0)

{

a[i] = p->data;

i++;

}

p = p->next;

}

cout<<"\n\n\t Set U - (A U B): ";

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

cout<<" "<<a[j];

}