**AIM : A book consists of chapters, chapters consist of sections and sections consist of**

**subsections. Construct a tree and print the nodes. Find the time and space requirements**

**of your method**

**PROGRAM**

#include<iostream>

#include<stdlib.h>

#include<string.h>

using namespace std;

struct node

{ char name[20];

node \*next;

node \*down;

int flag;

};

class Gll

{ char ch[20]; int n,i;

node \*head=NULL,\*temp=NULL,\*t1=NULL,\*t2=NULL;

public:

node \*create();

void insertb();

void insertc();

void inserts();

void insertss();

void displayb();

};

node \*Gll::create()

{

node \*p=new(struct node);

p->next=NULL;

p->down=NULL;

p->flag=0;

cout<<"\n enter the name";

cin>>p->name;

return p;

}

void Gll::insertb()

{

if(head==NULL)

{ t1=create();

head=t1;

}

else

{

cout<<"\n book exist";

}

}

void Gll::insertc()

{

if(head==NULL)

{

cout<<"\n there is no book";

}

else

{ cout<<"\n how many chapters you want to insert";

cin>>n;

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

{

t1=create();

if(head->flag==0)

{ head->down=t1; head->flag=1; }

else

{ temp=head;

temp=temp->down;

while(temp->next!=NULL)

temp=temp->next;

temp->next=t1;

}

}

}

}

void Gll::inserts()

{

if(head==NULL)

{

cout<<"\n there is no book";

}

else

{ cout<<"\n Enter the name of chapter on which you want to enter the section";

cin>>ch;

temp=head;

if(temp->flag==0)

{ cout<<"\n their are no chapters on in book";

}

else

{ temp=temp->down;

while(temp!=NULL)

{

if(!strcmp(ch,temp->name))

{

cout<<"\n how many sections you want to enter";

cin>>n;

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

{

t1=create();

if(temp->flag==0)

{ temp->down=t1;

temp->flag=1; cout<<"\n\*\*\*\*\*\*";

t2=temp->down;

}

else

{

cout<<"\n#####";

while(t2->next!=NULL)

{ t2=t2->next; }

t2->next=t1;

}

}

break;

}

temp=temp->next;

}

}

}

}

void Gll::insertss()

{

if(head==NULL)

{

cout<<"\n there is no book";

}

else

{ cout<<"\n Enter the name of chapter on which you want to enter the section";

cin>>ch;

temp=head;

if(temp->flag==0)

{ cout<<"\n their are no chapters on in book";

}

else

{ temp=temp->down;

while(temp!=NULL)

{

if(!strcmp(ch,temp->name))

{

cout<<"\n enter name of section in which you want to enter the sub section";

cin>>ch;

if(temp->flag==0)

{ cout<<"\n their are no sections "; }

else

{ temp=temp->down;

while(temp!=NULL)

{

if(!strcmp(ch,temp->name))

{

cout<<"\n how many subsections you want to enter";

cin>>n;

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

{

t1=create();

if(temp->flag==0)

{ temp->down=t1;

temp->flag=1; cout<<"\n\*\*\*\*\*\*";

t2=temp->down;

}

else

{

cout<<"\n#####";

while(t2->next!=NULL)

{ t2=t2->next; }

t2->next=t1;

}

}

break;

} temp=temp->next;

}

}

}

temp=temp->next;

}

}

}

}

void Gll::displayb()

{

if(head==NULL)

{ cout<<"\n book not exist";

}

else

{

temp=head;

cout<<"\n NAME OF BOOK: "<<temp->name;

if(temp->flag==1)

{

temp=temp->down;

while(temp!=NULL)

{ cout<<"\n\t\tNAME OF CHAPTER: "<<temp->name;

t1=temp;

if(t1->flag==1)

{ t1=t1->down;

while(t1!=NULL)

{ cout<<"\n\t\t\t\tNAME OF SECTION: "<<t1->name;

t2=t1;

if(t2->flag==1)

{ t2=t2->down;

while(t2!=NULL)

{ cout<<"\n\t\t\t\t\t\tNAME OF SUBSECTION: "<<t2->name;

t2=t2->next;

}

}

t1=t1->next;

}

}

temp=temp->next;

}

}

}

}

int main()

{ Gll g; int x;

while(1)

{ cout<<"\n\n enter your choice";

cout<<"\n 1.insert book";

cout<<"\n 2.insert chapter";

cout<<"\n 3.insert section";

cout<<"\n 4.insert subsection";

cout<<"\n 5.display book";

cout<<"\n 6.exit";

cin>>x;

switch(x)

{ case 1: g.insertb();

break;

case 2: g.insertc();

break;

case 3: g.inserts();

break;

case 4: g.insertss();

break;

case 5: g.displayb();

break;

case 6: exit(0);

}

}

return 0;

}