**Practical No.3**

**PROGRAM:**

#include <iostream>

#include <cstdlib>

#include <vector>

#include <cstring>

using namespace std;

struct Node

{

char label[60];

int chcount;

vector<Node\*>child;

};

class General

{

public:

Node\* root;

General()

{

root=nullptr;

}

void insert();

void display(Node\* r,int depth=0);

void show();

~General();

void deleteTree(Node\* r);

};

void General::insert()

{

root=new Node();

cout<<"Enter the name of the book: ";

cin.ignore();

cin.getline(root->label,60);

cout<<"Enter the total number of chapters in the book: ";

cin>>root->chcount;

for(int i=0;i<root->chcount;i++)

{

Node\* chapter=new Node();

cout<<"Enter the name of chapter: ";

cin.ignore();

cin.getline(chapter->label,60);

cout<<"Enter the number of sections in chapter: ";

cin>>chapter->chcount;

for(int j=0;j<chapter->chcount;j++)

{

Node\* section=new Node();

cout<<"Enter the name of section: ";

cin.ignore();

cin.getline(section->label,60);

cout<<"Enter the number of subsections in section: ";

cin>>section->chcount;

for(int k=0;k<section->chcount;k++)

{

Node\* subsection=new Node();

cout<<"Enter the name of subsection:";

cin.ignore();

cin.getline(subsection->label,60);

section->child.push\_back(subsection);

}

chapter->child.push\_back(section);

}

root->child.push\_back(chapter);

}

}

void General::display(Node\* r,int depth)

{

if(r==nullptr)

return;

for(int i=0;i<depth;i++)

cout<<" ";

cout<<r->label<<endl;

for(int i=0;i<r->child.size();i++)

{

display(r->child[i],depth+1);

}

}

void General::show()

{

if(root==nullptr)

{

cout<<"No book data available."<<endl;

return;

}

cout<<"\*\*\*\*\*\*\*\*\*\* Hierarchy of Book \*\*\*\*\*\*\*\*\*\*"<<endl;

display(root);

}

void General::deleteTree(Node\* r)

{

if(r==nullptr)

return;

for(int i=0;i<r->child.size();i++)

{

deleteTree(r->child[i]);

}

delete r;

}

General::~General()

{

deleteTree(root);

}

int main()

{

General g;

int ch;

do

{

cout<<"~~~~~ MENU ~~~~~"<<endl;

cout<<"1. Insert"<<endl;

cout<<"2.Display"<<endl;

cout<<"3. Exit"<<endl;

cout<<"Enter the choice: ";

cin>>ch;

switch(ch)

{

case 1:g.insert();

break;

case 2:g.show();

break;

case 3:cout<<"Exiting program."<<endl;

break;

default:cout<<"Invalid choice."<<endl;

break;

}

}while(ch!=3);

return 0;

}

**OUTPUT:**

~~~~~ MENU ~~~~~

1. Insert

2.Display

3. Exit

Enter the choice: 1

Enter the name of the book: OOP

Enter the total number of chapters in the book: 2

Enter the name of chapter: Basic of oop

Enter the number of sections in chapter: 1

Enter the name of section: Introduction

Enter the number of subsections in section: 1

Enter the name of subsection:History

Enter the name of chapter: 2

Enter the number of sections in chapter: 1

Enter the name of section: CONCEPT OF OOP

Enter the number of subsections in section: 2

Enter the name of subsection:Data type

Enter the name of subsection:Constructor

~~~~~ MENU ~~~~~

1. Insert

2.Display

3. Exit

Enter the choice: 2

\*\*\*\*\*\*\*\*\*\* Hierarchy of Book \*\*\*\*\*\*\*\*\*\*

OOP

Basic of oop

Introduction

History

CONCEPT OF OOP

Data type

Constructor

~~~~~ MENU ~~~~~

1. Insert

2.Display

3. Exit

Enter the choice: 3

Exiting program.