Practical no.3

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COB-249

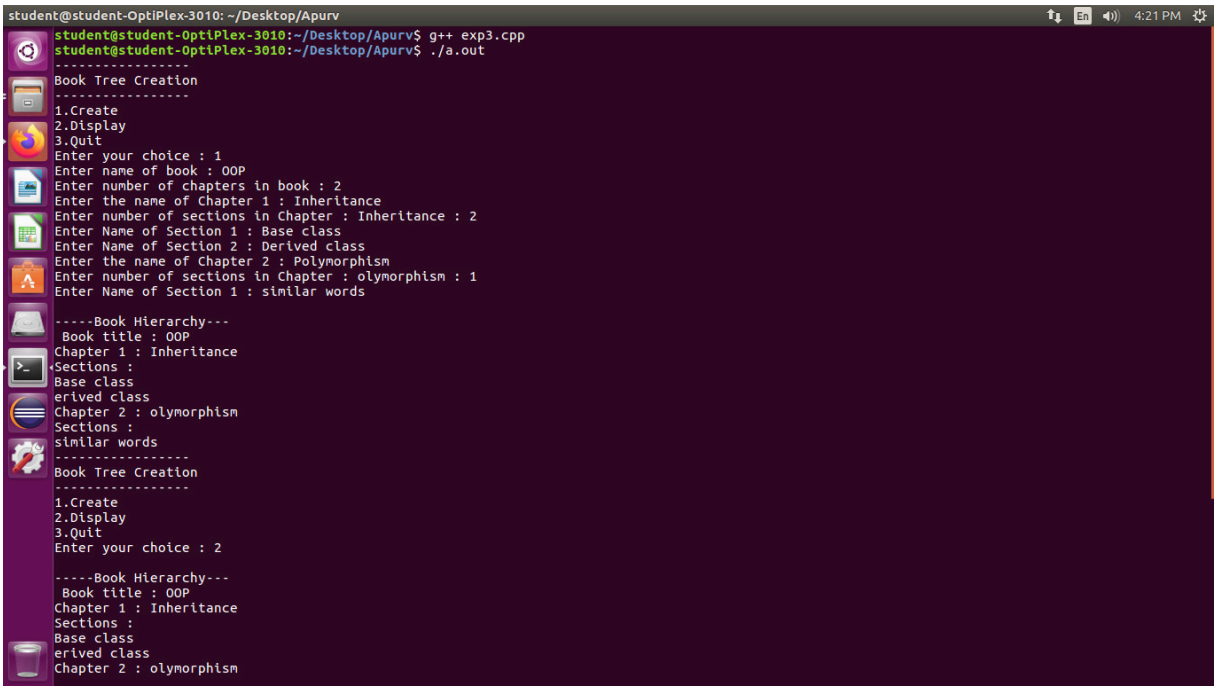
```
#include<iostream>
#include <string>
#include<limits>//Forinputvalidation using
namespace std;
struct node {
string label;
intch_count;
node* child[10];
node():ch_count(0){
for(inti=0;i<10;i++){
child[i] = nullptr;
}
}
};
class GT {
node*root;
public:
GT():root(nullptr){}
~GT(){
deleteTree(root);
}
voidcreate(){
if(root!=nullptr){
deleteTree(root);
}
root=new node;
```

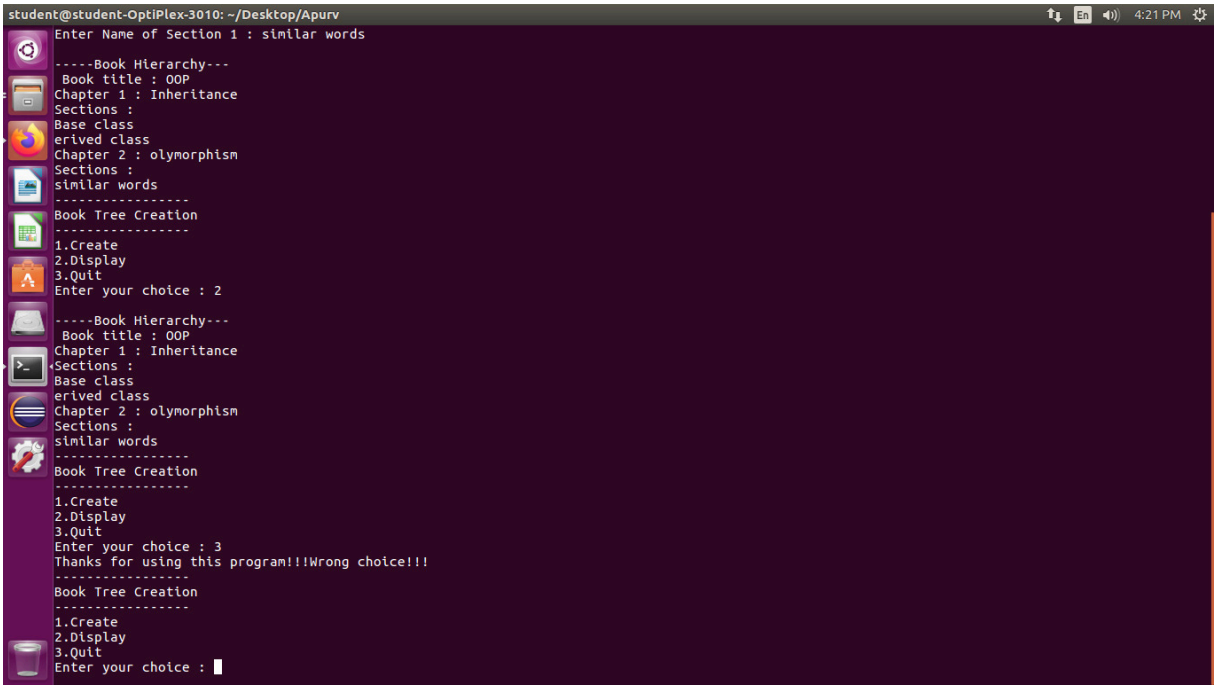
```
cout <<"Enter the name of the book: ";
cin.ignore(numeric_limits<streamsize>::max(),'\n');//Clearinputbuffer
getline(cin, root->label);
root->ch_count=getInput("Enterthenumberofchapters:"); for
(int i = 0; i < root->ch_count; i++) {
root->child[i]=newnode;
cout<<"Enterthenameofchapter"<<i+1<<":"; getline(cin,
root->child[i]->label);
root->child[i]->ch_count=getInput("Enterthenumberofsectionsinchapter"+to_string(i+1)+": ");
for(intj=0;j<root->child[i]->ch_count;j++){
root->child[i]->child[j] = new node;
cout<<"Enterthenameofsection"<<i+1<<"-"<<j+1<<":"; getline(cin,
root->child[i]->child[j]->label);
root->child[i]->child[j]->ch_count=getInput("Enterthenumberofsubsectionsinsection"+ to_string(i +
1) + "-" + to_string(j + 1) + ": ");
for(intk=0;k<root->child[i]->child[j]->ch_count;k++){
root->child[i]->child[j]->child[k] = new node;
cout<<"Enterthe nameofsubsection"<< i+1 <<"-"<< j+ 1<<"-"<<k +1<<":"; getline(cin,
root->child[i]->child[j]->child[k]->label);
}
}
}
}
voiddisplay()const{ if
(!root) {
cout<<"Nobookinformationavailable.\n";
return;
}
cout<<"\nBookStructure:\n";
display(root);
}
```

```
private:
intgetInput(conststring&prompt)const{ int
value;
while (true) {
cout<<prompt;
cin >> value;
if(cin.fail()||value<0||value>10){
cin.clear();
cin.ignore(numeric_limits<streamsize>::max(),'\n');
cout<<"Invalidinput.Pleaseenteranumberbetween0and10.\n";
} else{
cin.ignore(numeric_limits<streamsize>::max(),'\n');//Clearinputbuffer
return value;
}
}
}
voiddisplay(constnode*r,intlevel=0)const{ if (r
== nullptr) return;
for(inti=0;i<level;i++){ cout
<<"\t";
}
cout<<r->label<<endl;
for(inti=0;i<r->ch_count;i++){
display(r->child[i], level + 1);
}
}
voiddeleteTree(node*r){ if
(!r) return;
for(inti=0;i<r->ch_count;i++){
deleteTree(r->child[i]);
}
```

```
deleter;
}
};
intmain(){ GT g;
while(true){
cout <<"\n--- MAIN MENU ---"<< endl; cout <<"1 -> Add
book info"<< endl; cout<<"2->Displaybookinfo"<<endl;
cout <<"3 -> Exit"<< endl;
cout<<"Chooseanoption(1-3):"; int ch;
cin >> ch; switch(ch){ case 1:
g.create(); break; case 2:
g.display(); break;case 3:
cout<<"\nExitingprogram...\n"; return 0;
default:
cout<<"Invalidchoice.Pleasechooseavalidoption(1-3)."<<endl;
}
}
}
```

output -


student@student-OptiPlex-3010: ~/Desktop/Apurv
En
4:21 PM
student@student-OptiPlex-3010:~/Desktop/Apurv$ g++ exp3.cpp
student@student-OptiPlex-3010:~/Desktop/Apurv$ ./a.out
Book Tree Creation
1.Create
2.Display
3.Quit
Enter your choice : 1
Enter name of book : OOP
Enter number of chapters in book : 2
Enter the name of Chapter 1 : Inheritance
Enter number of sections in Chapter : Inheritance : 2
Enter Name of Section 1 : Base class
Enter Name of Section 2 : Derived class
Enter the name of Chapter 2 : Polymorphism
Enter number of sections in Chapter : olymorphism : 1
Enter Name of Section 1 : similar words
-----Book Hierarchy---
Book title : OOP
Chapter 1 : Inheritance
Sections :
Base class
erived class
Chapter 2 : olymorphism
Sections :
similar words
Book Tree Creation
1.Create
2.Display
3.Quit
Enter your choice : 2
-----Book Hierarchy---
Book title : OOP
Chapter 1 : Inheritance
Sections :
Base class
erived class
Chapter 2 : olymorphism


student@student-OptiPlex-3010: ~/Desktop/Apurv
En
4:21 PM
Enter Name of Section 1 : similar words
-----Book Hierarchy---
Book title : OOP
Chapter 1 : Inheritance
Sections :
Base class
erived class
Chapter 2 : olymorphism
Sections :
similar words
Book Tree Creation
1.Create
2.Display
3.Quit
Enter your choice : 2
-----Book Hierarchy---
Book title : OOP
Chapter 1 : Inheritance
Sections :
Base class
erived class
Chapter 2 : olymorphism
Sections :
similar words
Book Tree Creation
1.Create
2.Display
3.Quit
Enter your choice : 3
Thanks for using this program!!!Wrong choice!!!
Book Tree Creation
1.Create
2.Display
3.Quit
Enter your choice :