**Practical GroupB\_05**

**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.

**Code:**

#include <iostream>

#include <string.h>

using namespace std;

struct node // Node Declaration

{

string label;

//char label[10];

int ch\_count;

struct node \*child[10];

} \* root;

class GT // Class Declaration

{

public:

void create\_tree();

void display(node \*r1);

GT()

{

root = NULL;

}

};

void GT::create\_tree()

{

int tbooks, tchapters, i, j, k;

root = new node;

cout << "Enter name of book : ";

cin.get();

getline(cin, root->label);

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

cin >> tchapters;

root->ch\_count = tchapters;

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

{

root->child[i] = new node;

cout << "Enter the name of Chapter " << i + 1 << " : ";

cin.get();

getline(cin, root->child[i]->label);

cout << "Enter number of sections in Chapter : " << root->child[i]->label << " : ";

cin >> root->child[i]->ch\_count;

for (j = 0; j < root->child[i]->ch\_count; j++)

{

root->child[i]->child[j] = new node;

cout << "Enter Name of Section " << j + 1 << " : ";

cin.get();

getline(cin, root->child[i]->child[j]->label);

}

}

}

void GT::display(node \*r1)

{

int i, j, k, tchapters;

if (r1 != NULL)

{

cout << "\n-----Book Hierarchy---";

cout << "\n Book title : " << r1->label;

tchapters = r1->ch\_count;

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

{

cout << "\nChapter " << i + 1;

cout << " : " << r1->child[i]->label;

cout << "\nSections : ";

for (j = 0; j < r1->child[i]->ch\_count; j++)

{

cout << "\n"<< r1->child[i]->child[j]->label;

}

}

}

cout << endl;

}

int main()

{

int choice;

GT gt;

while (1)

{

cout << "-----------------" << endl;

cout << "Book Tree Creation" << endl;

cout << "-----------------" << endl;

cout << "1.Create" << endl;

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

cout << "3.Quit" << endl;

cout << "Enter your choice : ";

cin >> choice;

switch (choice)

{

case 1:

gt.create\_tree();

case 2:

gt.display(root);

break;

case 3:

cout << "Thanks for using this program!!!";

exit(1);

default:

cout << "Wrong choice!!!" << endl;

}

}

return 0;

}