ASSIGNMENT NO.5

TITLE: A book consists of chapters, chapters consist of sections and sections consist of subsections. Construct a tree to represent this structure and print the nodes. Find the time and space requirements of your method.

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PROGRAM:

```
#include<iostream>
#include<string.h>
using namespace std;
struct book_node {
        char title[20];
        int chapt_count;
        book_node *down[10];
}*root;
class book {
        public:
                //book_node *root;
                void create_tree();
                void display(book_node *r);
        book() {
                root=NULL;
        } };
void book::create_tree() {
         int i,j,k;
        root=new book_node;
        cout<<"Enter name of the book: "<<endl;
        fflush(stdin);
        gets(root->title);
        cout<<"Enter total number of chapters in the book: "<<endl;
        cin>>root->chapt_count;
//      cout<<root->chapt_count;
        for(i=0;i<root->chapt_count;i++)
        {
        root->down[i]=new book_node;
        cout<<"Enter Name for chapter "<<i+1<<endl;
        fflush(stdin);
        gets(root->down[i]->title);
        cout<<"Enter no. of sections in  "<<root->down[i]->title<<endl;
        cin>>root->down[i]->chapt_count;
        cout<<"Enter details for chapter " <<i+1<<endl;
        for(j=0;j<root->down[i]->chapt_count;j++) {
        root->down[i]->down[j]=new book_node;
        cout<<"Enter title for section "<<j+1<<endl;
        fflush(stdin);
        gets(root->down[i]->down[j]->title);
        cout<<"Enter no. of sub sections in section "<<j+1<<endl;
        cin>>root->down[i]->down[j]->chapt_count;
        for(k=0;k<root->down[i]->down[j]->chapt_count;k++) {
        root->down[i]->down[j]->down[k]=new book_node;
        cout<<"Enter title for subsection "<<k+1<<endl;
```

```
        fflush(stdin);
        gets(root->down[i]->down[j]->down[k]->title);
        }}} }
void book::display(book_node *r)
{   int i,j,k;
        if(r!=NULL) {
                cout<<"****index****"<<endl;
                cout<<"Book Title: "<<r->title<<endl<<endl;
                for(i=0;i<r->chapt_count;i++)
        {  cout<<"\t";
            cout<<"Chapter " <<i+1<<": "<<r->down[i]->title<<endl;
            for(j=0;j<r->down[i]->chapt_count;j++)  {
                  cout<<"\t\t";
            cout<<"Section "<<j+1<<": "<<r->down[i]->down[j]->title<<endl;

                  for(k=0;k<r->down[i]->down[j]->chapt_count;k++)
                  {  cout<<"\t\t\t";
                        cout<<"Sub Section "<<k +1<<": "<<r->down[i]->down[j]->down[k]-
>title<<endl;
        }}}}}
int main() {
        int choice;
        book book;
        while(1) {
                cout<<"Menu:"<<endl;
                cout<< "Book tree structure"<<endl;
                cout<<"1. Create tree"<<endl;
                cout<<"2. Display tree"<<endl;
                cout<<"3. Exit"<<endl;
                cout<< "Enter your choice"<<endl;
                cin>>choice;
                switch(choice) {
                case 1:
                        book.create_tree();
                        break;
                        case 2:
                        book.display(root);
                        break;
                case 3:
                        exit(0);
}}
 return 0;
}
```

OUTPUT:

```
Menu:
Book tree structure
1. Create tree
2. Display tree
3. Exit
Enter your choice
1
Enter name of the book:
THE SECRET
```

Enter total number of chapters in the book:
2
Enter Name for chapter 1
THE SECRET MADE SIMPLE
Enter no. of sections in THE SECRET MADE SIMPLE
1
Enter details for chapter 1
Enter title for section 1
THE GREATEST EMOTION
Enter no. of sub sections in section 1
0
Enter Name for chapter 2
THE SECRET TO YOU
Enter no. of sections in THE SECRET TO YOU
2
Enter details for chapter 2
Enter title for section 1
THE ONE UNIVERSAL MIND
Enter no. of sub sections in section 1
2
Enter title for subsection 1
JOHN ASSARAF SAY
Enter title for subsection 2
LISA NOCHOLS
Enter title for section 2
YOU ARE NOT YOUR PAST
Enter no. of sub sections in section 2
0
Menu:
Book tree structure
1. Create tree
2. Display tree
3. Exit
Enter your choice
2
****index****
Book Title: THE SECRET

Chapter 1: THE SECRET MADE SIMP
Section 1: THE GREATEST EMOTION
Chapter 2: THE SECRET TO YOU
Section 1: THE ONE UNIVERSAL MI
Sub Section 1: JOHN ASSARAF SAY
Sub Section 2: LISA NOCHOLS
Section 2: YOU ARE NOT YOUR PAS