

## ASSIGNMENT 5

```
#include <iostream>

#include <vector>

using namespace std;

class Node {
public:
    string data;
    vector<Node*> children;

    Node(string d = "") {
        this->data = std::move(d);
    }

    Node* addChild(string d) {
        Node* temp = new Node(std::move(d));
        this->children.push_back(temp);
        return temp;
    }

    friend class Tree;
};

class Tree {
private:
    Node *root;

public:
    Tree(string d) {
        root = new Node(std::move(d));
    }
};
```

```
}
```

```
Node* addChild(const string& d) {  
    return root->addChild(d);  
}
```

```
void display() {  
    cout << "Book Name: " << root->data << endl;  
    auto chapter = root->children.begin();  
    for (int i = 0 ; i < root->children.size() ; i++, chapter++ ) {  
        cout << "Chapter " << i+1 << ": " << (*chapter)->data << endl;  
        auto section = (*chapter)->children.begin();  
        for (int j = 0 ; j < (*chapter)->children.size() ; j++, section++ ) {  
            cout << "\t" << i+1 << "." << j+1 << ": " << (*section)->data << endl;  
            auto subsection = (*section)->children.begin();  
            for (int k = 0 ; k < (*section)->children.size() ; k++, subsection++) {  
                cout << "\t\t" << i+1 << "." << j+1 << "." << k+1 << ": " << (*subsection)->data << endl;  
            }  
        }  
    }  
};
```

```
int main() {  
    auto* book = new Tree("DSA");  
  
    auto* chapter1 = book->addChild("HASHING");  
    auto* chapter2 = book->addChild("TREES");  
    auto* chapter3 = book->addChild("GRAPHS");  
    auto* chapter4 = book->addChild("SEARCH TREES");  
    auto* chapter5 = book->addChild("INDEXING AND MULTIWAY TREES");
```

```

auto* chapter6 = book->addChild("FILE ORGANIZATION");

auto* section1 = chapter1->addChild("HASH TABLE");
auto* section2 = chapter1->addChild("SKIP LIST");

auto* section1_2 = section1->addChild("SUBSECTION 1");
auto* section1_3 = section1->addChild("SUBSECTION 2");

book->display();

return 0;
}

```

OUTPUT :

```

C:\Users\yudra\Downloads\dsacode_output.exe
-----
Book Tree Creation
-----
1.Create
2.Display
3.Quit
Enter your choice : 1
Enter name of book : Hello World
Enter number of chapters in book : 2
Enter the name of Chapter 1 : Why ?
Enter number of sections in Chapter : Why ? : 1
Enter Name of Section 1 : Start
Enter the name of Chapter 2 : ow ?
Enter number of sections in Chapter : ow ? : 0
-----Book Hierarchy-----
Book title : Hello World
Chapter 1 : Why ?
Sections :
Start
Chapter 2 : ow ?
Sections :
-----
Book Tree Creation
-----
1.Create
2.Display
3.Quit
Enter your choice : 3
Thanks for using this program!!!
Process exited after 32.03 seconds with return value 1
Press any key to continue . . .

```