

## C++FA 2.1 Tree Class Example

This simple example shows the inner workings of a Tree class used to store stock prices. The Tree class maintains an array of pointers to Trees. By passing a symbol to the add() method, each character is converted to an index through recursion. Also, a data file has been added to initialize the tree. This example fits in section C++FA 2.1 of *C++ with Financial Applications* by Ben Van Vliet, available at [www.benvanvliet.net](http://www.benvanvliet.net).

### Hash\_Map.h

```
#include <fstream>
using namespace std;

class Tree
{
private:
    Tree **tree;

public:
    double Price;

    Tree() : Price( 0 )
    {
        tree = new Tree *[ 26 ];
        for( int i = 0; i < 26; ++i )
            tree[ i ] = NULL;
    }

    ~Tree()
    {
        for( int i = 0; i < 26; i++ )
            delete tree[ i ];
    }

    void read( ifstream &symbols )
    {
        char s[ 5 ];
        while ( symbols.getline( s, 5 ) )
        {
            add( s );
        }
    }

    void add( char *sym )
    {
        if( sym[ 1 ] == '\\0' && tree[ ( ( int ) *sym ) - 65 ] == NULL )
        {
            tree[ ( ( int ) *sym ) - 65 ] = new Tree();
        }
        else
        {
            if( tree[ ( ( int ) *sym ) - 65 ] == NULL )
            {

```

```

        tree[ ( ( int ) *sym ) - 65 ] = new Tree();
    }
    tree[ ( ( int ) *sym ) - 65 ]->add( sym + 1 );
}

Tree *item( char *sym )
{
    if ( sym[ 1 ] == '\0' )
    {
        return tree[ ( ( int ) *sym ) - 65 ];
    }
    else
    {
        return tree[ ( ( int ) *sym ) - 65 ]->item( sym + 1 );
    }
}
};

```

### Main.cpp for Tree

```

#include <iostream>
#include <string>
#include "Tree.h"
using namespace std;

int main()
{
    Tree *root = new Tree;

    ifstream symbols("C:\\temp\\Symbols.txt");
    root->read( symbols );

    root->item( "SUNW" )->Price = 50;
    root->item( "WMT" )->Price = 75;
    root->item( "X" )->Price = 65;
    root->item( "BP" )->Price = 56;

    cout << root->item( "SUNW" )->Price << endl;
    cout << root->item( "WMT" )->Price << endl;
    cout << root->item( "X" )->Price << endl;
    cout << root->item( "BP" )->Price << endl;

    delete root;

    return 0;
}

```

### Symbols.txt

IBM

A  
SUNW  
MSFT  
LUV  
WMT  
X  
CHV  
XOM  
BP