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...signments\131_Assignment_11\Question-2\Question-2.cpp 1
1 // Question-2.cpp : This file contains the 'main' function. Program 2
  execution begins and ends there.
2 //// Question1.cpp : This file contains the 'main' function. Program 2
  execution begins and ends there.
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4 //Name Sai Chaitanya Kilambi
5 //Course CPSC 131 Data Structures, Fall, 2022
6 //Assignment No.11 question:2
7 //Due date 11/30/2022
8 // Purpose:
9 // This program demonstrates insertion of data in array into a Binary 2
  Search Tree along with inorder traversal.
10 // It also demonstrates how to search display the min and max
11 //----- 2
  -----
12 // list of libraries
13 //
14 //importing the required libraries
15
16 #include<iostream>
17 #include<climits>
18 using namespace std;
19 typedef struct node {
20     int value;
21     node* pLeft;
22     node* pRight;
23     node(int val = 0)
24     {
25         value = val;
26         pRight = NULL;
27         pLeft = NULL;
28     }
29 }node;
30 void insert(node** pRoot, int val) {
31     if (*pRoot == NULL)
32         *pRoot = new node(val);
33     else if ((*pRoot)->value <= val)
34         insert(&((*pRoot)->pRight), val);
35     else if ((*pRoot)->value > val)
36         insert(&((*pRoot)->pLeft), val);
37 }
38 node* getBST(int* arr, int size) {
39     node* pRoot = NULL;
40     for (int i = 0; i < size; i++)
41         insert(&pRoot, arr[i]);
42     return pRoot;
43 }

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44 void inOrderTraversal(node* pRoot) {
45     if (pRoot && pRoot->pLeft)
46         inOrderTraversal(pRoot->pLeft);
47     if (pRoot)
48         std::cout << pRoot->value << " ";
49     if (pRoot && pRoot->pRight)
50         inOrderTraversal(pRoot->pRight);
51 }
52 }
53 int findMin(node* root)
54 {
55     // Base case
56     if (root == NULL)
57         return INT_MAX;
58     int res = root->value;
59     int lres = findMin(root->pLeft);
60     int rres = findMin(root->pRight);
61     if (lres < res)
62         res = lres;
63     if (rres < res)
64         res = rres;
65     return res;
66 }
67 int findMax(node* root)
68 {
69     if (root == NULL)
70         return INT_MIN;
71     int res = root->value;
72     int lres = findMax(root->pLeft);
73     int rres = findMax(root->pRight);
74     if (lres > res)
75         res = lres;
76     if (rres > res)
77         res = rres;
78     return res;
79 }
80 int main() {
81     int arr[12];
82     srand(time(0));
83     cout << "Array elements are: ";
84     for (int i = 0; i < 12; i++) {
85         arr[i] = rand() % 100;
86         cout << arr[i] << " ";
87     }
88     cout << endl;
89     node* pRoot = getBST(arr, sizeof(arr) / sizeof(int));
90     cout << "Inorder traversal of tree is: ";
91     inOrderTraversal(pRoot);
92     cout << endl;
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93     cout << "Maximum element is BST is " << findMax(pRoot) << endl;
94     cout << "Minimum element is BST is " << findMin(pRoot) << endl;
95     return 0;
96 }
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