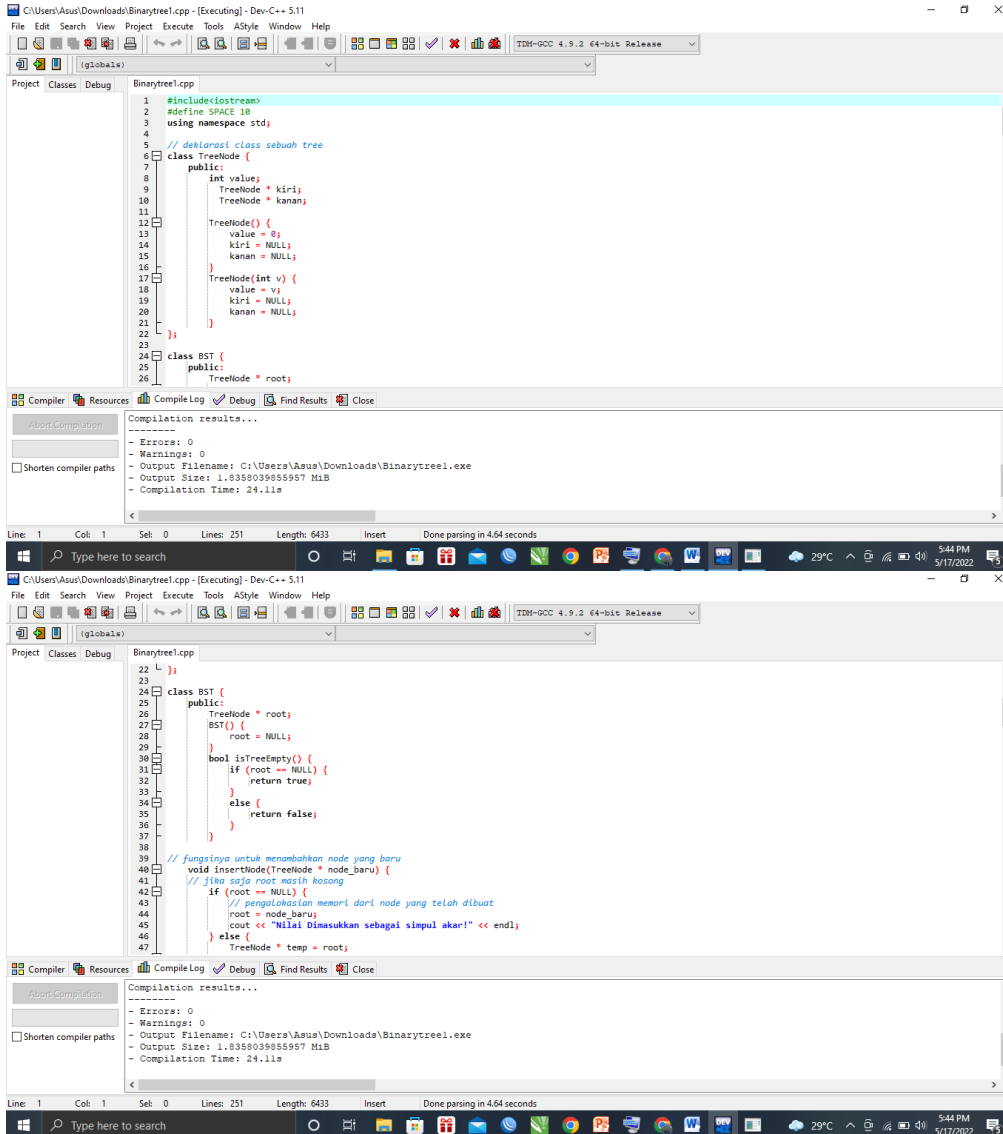


Kelompok 5

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Fungsinya Membangun Tree Binary



```
1 #include <iostream>
2 #define SPACE 10
3 using namespace std;
4
5 // deklarasi class sebuah tree
6 class TreeNode {
7 public:
8     int value;
9     TreeNode * kiri;
10    TreeNode * kanan;
11
12    TreeNode() {
13        value = 0;
14        kiri = NULL;
15        kanan = NULL;
16    }
17    TreeNode(int v) {
18        value = v;
19        kiri = NULL;
20        kanan = NULL;
21    }
22 };
23
24 class BST {
25 public:
26     TreeNode * root;
27
28     BST() {
29         root = NULL;
30     }
31
32     bool isEmpty() {
33         if (root == NULL) {
34             return true;
35         }
36         else {
37             return false;
38         }
39     }
40
41     // fungsinya untuk menambahkan node yang baru
42     void insertNode(TreeNode * node_baru) {
43         // jika saja root masih kosong
44         if (root == NULL) {
45             // pengalokasian memori dari node yang telah dibuat
46             root = node_baru;
47             cout << "Nilai Dimasukkan sebagai simpul akar!" << endl;
48         }
49         else {
50             TreeNode * temp = root;
51
52             while (temp != NULL) {
53                 if (temp->kiri == NULL) {
54                     temp->kiri = node_baru;
55                     break;
56                 }
57                 else if (temp->kanan == NULL) {
58                     temp->kanan = node_baru;
59                     break;
60                 }
61                 temp = temp->kiri;
62             }
63         }
64     }
65 }
```

Compilation results...

Errors: 0
Warnings: 0
Output Filename: C:\Users\Asus\Downloads\Binarytree.exe
Output Size: 1.8358039855957 MiB
Compilation Time: 24.11s

C:\Users\Asus\Downloads\Binarytree1.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug Binarytree1.cpp

```
46 } else {
47     TreeNode * temp = root;
48     while (temp != NULL) {
49         if (node_baru -> value == temp -> value) {
50             cout << "Nilai Sudah ada," <<
51              "Masukkan nilai lain!" << endl;
52             return;
53         } else if ((node_baru -> value < temp -> value) && (temp -> kiri == NULL)) {
54             temp -> kiri = node_baru;
55             cout << "Nilai Disisipkan ke kiri!" << endl;
56             break;
57         } else if (node_baru -> value < temp -> value) {
58             temp = temp -> kiri;
59         } else if ((node_baru -> value > temp -> value) && (temp -> kanan == NULL)) {
60             temp -> kanan = node_baru;
61             cout << "Nilai Disisipkan di sebelah kanan!" << endl;
62             break;
63         } else {
64             temp = temp -> kanan;
65         }
66     }
67 }
68
69 TreeNode* insertRecursive(TreeNode *r, TreeNode *node_baru){
70     if(r==NULL){
71         r=node_baru;
72     }
73 }
```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

- Errors: 0

- Warnings: 0

- Output Filename: C:\Users\Asus\Downloads\Binarytree1.exe

- Output Size: 1.8358039855957 MiB

- Compilation Time: 24.11s

Line: 1 Col: 1 Sel: 0 Lines: 251 Length: 6433 Insert Done parsing in 4.64 seconds

C:\Users\Asus\Downloads\Binarytree1.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug Binarytree1.cpp

```
70 if(r==NULL){
71     r=node_baru;
72     cout << "Penyisipan berhasil"<<endl;
73     return r;
74 }if(node_baru ->value < r->value){
75     r->kiri = insertRecursive(r->kiri,node_baru);
76 }else if (node_baru->value > r->value){
77     r->kanan = insertRecursive(r->kanan,node_baru);
78 }else{
79     cout << "Tidak ada nilai duplikat yang diizinkan!" << endl;
80     return r;
81 }
82 return r;
83 }
84
85 void print2D(TreeNode * r, int space) {
86     // base case 1
87     if (r == NULL)
88         return;
89     // untuk memperluas jarak antara level 2
90     space += SPACE;
91     // proses anak kanan dulu 3
92     print2D(r -> kanan, space);
93     cout << endl;
94     for (int i = SPACE; i < space; i++)
95         cout << " ";
96 }
```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

- Errors: 0

- Warnings: 0

- Output Filename: C:\Users\Asus\Downloads\Binarytree1.exe

- Output Size: 1.8358039855957 MiB

- Compilation Time: 24.11s

Line: 1 Col: 1 Sel: 0 Lines: 251 Length: 6433 Insert Done parsing in 4.64 seconds

C:\Users\Asus\Downloads\Binarytree1.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TM6-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug Binarytree1.cpp

```
94     for (int i = SPACE; i < space; i++)
95     {
96         cout << " ";
97         cout << r -> value << "\n";
98     }
99     // proses anak kiri ?
100     print2D(r -> kiri, space);
101 }
102 // simpul saat ini, kiri, kanan
103 void printPreorder(TreeNode * r){
104     if (r == NULL)
105     {
106         return;
107         cout << r -> value << " "; // untuk mencetak data simpul pertama
108         printPreorder(r -> kiri); // kemudian akan muncul kembali di subpohon kiri
109         printPreorder(r -> kanan); // sekarang akan muncul kembali di subpohon kanan
110     }
111 }
112 // kiri, simpul terkini, kanan
113 void printInorder(TreeNode * r)
114 {
115     if (r == NULL)
116     {
117         return;
118         // pertama muncul kembali di anak kiri
119         printInorder(r -> kiri);
120         // kemudian mencetak data di simpul
121         cout << r -> value << " ";
122         // sekarang akan muncul kembali di anak kanan
123     }
124 }
```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

- Errors: 0

- Warnings: 0

- Output Filename: C:\Users\Asus\Downloads\Binarytree1.exe

- Output Size: 1.8358039855957 MiB

- Compilation Time: 24.11s

Line: 1 Col: 1 Sel: 0 Lines: 251 Length: 6433 Insert Done parsing in 4.64 seconds

C:\Users\Asus\Downloads\Binarytree1.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TM6-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug Binarytree1.cpp

```
118     cout << r -> value << " ";
119     // sekarang akan muncul kembali di anak kanan
120     printInorder(r -> kanan);
121 }
122 }
123 // kiri, kanan, akar
124 void printPostorder(TreeNode * r)
125 {
126     if (r == NULL)
127     {
128         return;
129         // pertama muncul kembali di subpohon kiri
130         printPostorder(r -> kiri);
131         // kemudian akan muncul kembali di subpohon kanan
132         printPostorder(r -> kanan);
133         // sekarang sepaaket dengan simpul
134         cout << r -> value << " ";
135     }
136 }
137 // iterativeSearch(int v) {
138 //     if (root == NULL) {
139 //         return root;
140 //     }
141 //     else {
142 //         TreeNode * temp = root;
143 //         while (temp != NULL) {
144 //             if (v == temp -> value) {
145 //                 return temp;
146 //             }
147 //             temp = temp -> kiri;
148 //         }
149 //         temp = temp -> kanan;
150 //     }
151 // }
```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

- Errors: 0

- Warnings: 0

- Output Filename: C:\Users\Asus\Downloads\Binarytree1.exe

- Output Size: 1.8358039855957 MiB

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C:\Users\Asus\Downloads\Binarytree1.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug Binarytree1.cpp

```
145     temp = temp -> kiri;
146     } else {
147     temp = temp -> kanan;
148     }
149     }
150     return NULL;
151     }
152     }
153
154     TreeNode * recursiveSearch(TreeNode * r, int val) {
155     if (r == NULL || r -> value == val) {
156     return r;
157
158     else if (val < r -> value)
159     return recursiveSearch(r -> kiri, val);
160
161     else
162     return recursiveSearch(r -> kanan, val);
163     }
164
165     int height(TreeNode * r) {
166     if (r == NULL)
167     return -1;
168     else {
169     // tinggi komputer satu sama lain | persamaan tinggi sampul kanan | kiri
170     int lheight = height(r -> kiri);
```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

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- Warnings: 0

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- Output Size: 1.8358039855957 MiB

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Line: 1 Col: 1 Sel: 0 Lines: 251 Length: 6433 Insert Done parsing in 4.64 seconds

C:\Users\Asus\Downloads\Binarytree1.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug Binarytree1.cpp

```
169     // tinggi komputer satu sama lain | persamaan tinggi sampul kanan | kiri
170     int lheight = height(r -> kiri);
171     int rheight = height(r -> kanan);
172
173     // menggunakan yang terbesar
174     if (lheight > rheight)
175     return (lheight + 1);
176     else return (rheight + 1);
177     }
178
179     // mencetak simpul
180     void printGivenLevel(TreeNode * r, int level) {
181     if (r == NULL)
182     return;
183     else if (level == 0)
184     cout << r -> value << " ";
185     // level > 0
186     else
187     {
188     printGivenLevel(r -> kiri, level - 1);
189     printGivenLevel(r -> kanan, level - 1);
190     }
191     }
192     void printLevelOrderBFS(TreeNode * r) {
193     int h = height(r);
194     }
```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

- Errors: 0

- Warnings: 0

- Output Filename: C:\Users\Asus\Downloads\Binarytree1.exe

- Output Size: 1.8358039855957 MiB

- Compilation Time: 24.11s

Line: 1 Col: 1 Sel: 0 Lines: 251 Length: 6433 Insert Done parsing in 4.64 seconds

C:\Users\Asus\Downloads\Binarytree1.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug Binarytree1.cpp

```
196 | printGivenLevel(r, i);
197 | }
198 |
199 | TreeNode * minValueNode(TreeNode * node) {
200 |     TreeNode * current = node;
201 |     // perulangan untuk menemukan daun paling kiri
202 |     while (current->kiri != NULL) {
203 |         current = current->kiri;
204 |     }
205 |     return current;
206 | }
207 |
208 | }
209 |
210 | int main() {
211 |     //mengubah nama class menjadi objek
212 |     BST obj;
213 |     int pilihan, nilai;
214 |
215 |     do {
216 |         cout << "===== Menu =====" << endl;
217 |         cout << "0. Keluar Program" << endl;
218 |         cout << "1. Masukkan Simpul" << endl;
219 |         cout << "2. Mencetak Nilai BFS" << endl;
220 |         cout << endl;
221 |     }
```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

- Errors: 0

- Warnings: 0

- Output Filename: C:\Users\Asus\Downloads\Binarytree1.exe

- Output Size: 1.8358039855957 MiB

- Compilation Time: 24.11s

Line: 1 Col: 1 Sel: 0 Lines: 251 Length: 6433 Insert Done parsing in 4.64 seconds

C:\Users\Asus\Downloads\Binarytree1.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug Binarytree1.cpp

```
223 | // untuk mengubah variable;
224 | TreeNode * node_baru = new TreeNode();
225 |
226 | switch (pilihan) {
227 |     case 0:
228 |         break;
229 |     case 1:
230 |         cout << "Masukkan Angka : ";
231 |         cin >> nilai;
232 |         node_baru->value = nilai;
233 |         obj.root = obj.insertRecursive(obj.root, node_baru);
234 |         cout << endl;
235 |         break;
236 |     case 2:
237 |         cout << "Cetak" << endl;
238 |         obj.print2D(obj.root, 5);
239 |         cout << endl;
240 |         cout << "Mencetak Level Order BFS: \n";
241 |         obj.printLevelOrderBFS(obj.root);
242 |         cout << "\n\n";
243 |         break;
244 |     default:
245 |         cout << "Nomor yang anda masukkan tidak sesuai";
246 | }
247 |
248 | while (pilihan != 0);
```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

- Errors: 0

- Warnings: 0

- Output Filename: C:\Users\Asus\Downloads\Binarytree1.exe

- Output Size: 1.8358039855957 MiB

- Compilation Time: 24.11s

Line: 1 Col: 1 Sel: 0 Lines: 251 Length: 6433 Insert Done parsing in 4.64 seconds

Output Pemograman

```
C:\Users\Asus\Downloads\Binarytree1.exe
===== Menu =====
0. Keluar Program
1. Masukkan Simpul
2. Mencetak Nilai BFS

1
Masukkan Angka : 2
Penyisipan berhasil

===== Menu =====
0. Keluar Program
1. Masukkan Simpul
2. Mencetak Nilai BFS

1
Masukkan Angka : 4
Penyisipan berhasil

===== Menu =====
0. Keluar Program
1. Masukkan Simpul
2. Mencetak Nilai BFS

1
Masukkan Angka : 6
Penyisipan berhasil

===== Menu =====
0. Keluar Program
1. Masukkan Simpul
2. Mencetak Nilai BFS

1
Masukkan Angka : 8
Penyisipan berhasil

===== Menu =====
0. Keluar Program
1. Masukkan Simpul
2. Mencetak Nilai BFS

1
Masukkan Angka : 10
Penyisipan berhasil

C:\Users\Asus\Downloads\Binarytree1.exe
===== Menu =====
0. Keluar Program
1. Masukkan Simpul
2. Mencetak Nilai BFS

1
Masukkan Angka : 14
Penyisipan berhasil

===== Menu =====
0. Keluar Program
1. Masukkan Simpul
2. Mencetak Nilai BFS

1
Masukkan Angka : 19
Penyisipan berhasil

===== Menu =====
0. Keluar Program
1. Masukkan Simpul
2. Mencetak Nilai BFS

2
Cetak

      19
     /  \
    14   8
   /  \  /  \
  10  6 4   2
 /  \
4   2

Mencetak Level Order BFS:
2 4 6 8 10 14 19

===== Menu =====
```