Laporan struktur data

Binary Search Tree

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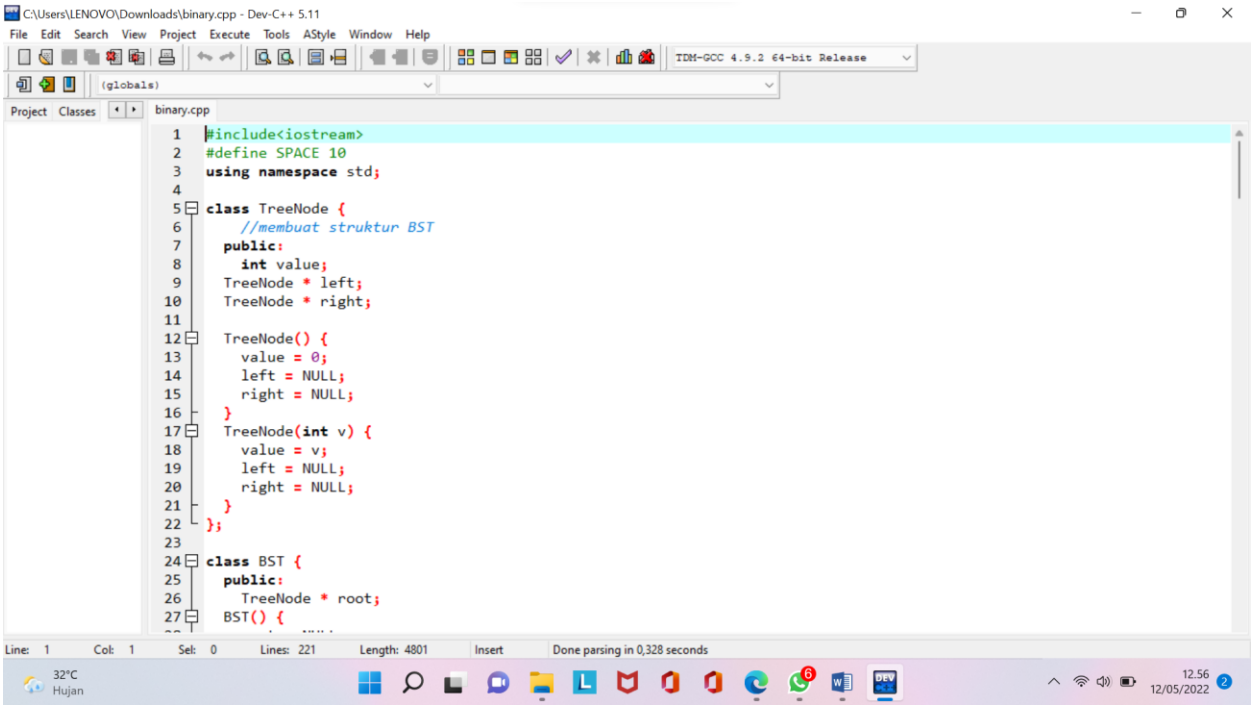
Manajemen informatika

Kodingan


C:\Users\LENOVO\Downloads\binary.cpp - 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
binary.cpp
#include<iostream>
#define SPACE 10
using namespace std;
class TreeNode {
//membuat struktur BST
public:
int value;
TreeNode * left;
TreeNode * right;
TreeNode() {
value = 0;
left = NULL;
right = NULL;
}
TreeNode(int v) {
value = v;
left = NULL;
right = NULL;
}
};
class BST {
public:
TreeNode * root;
BST() {
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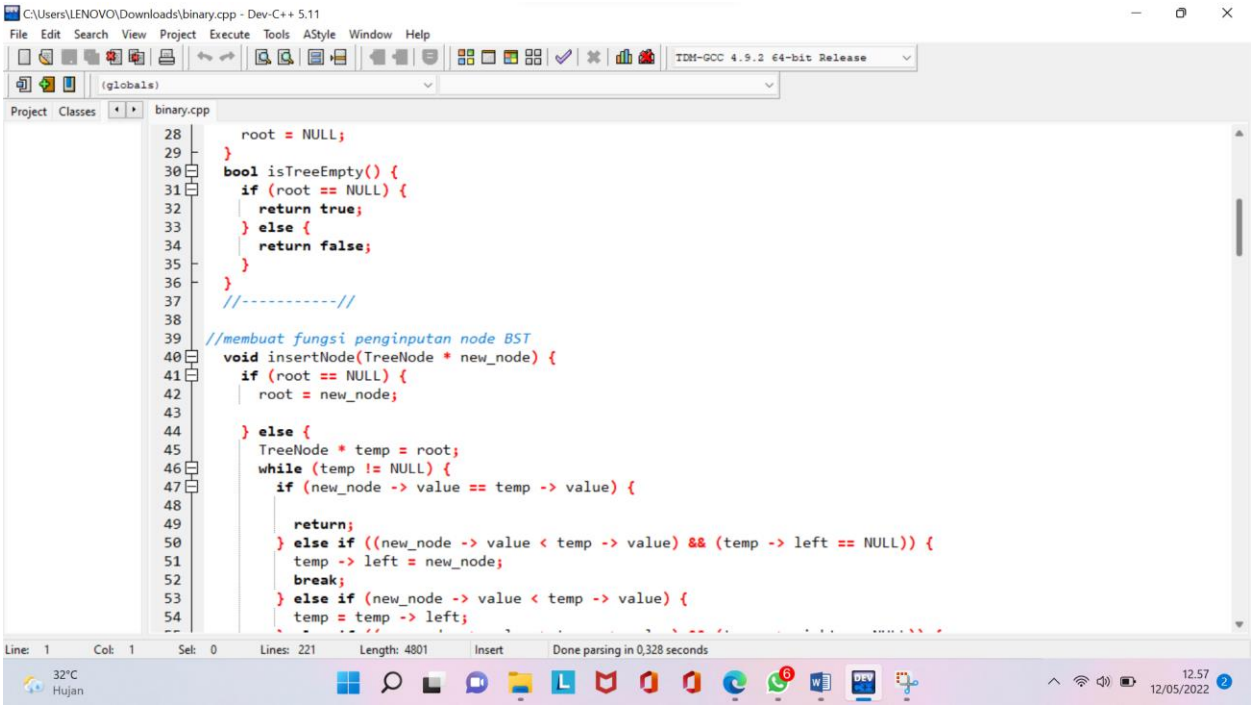
32°C Hujan
12.56 12/05/2022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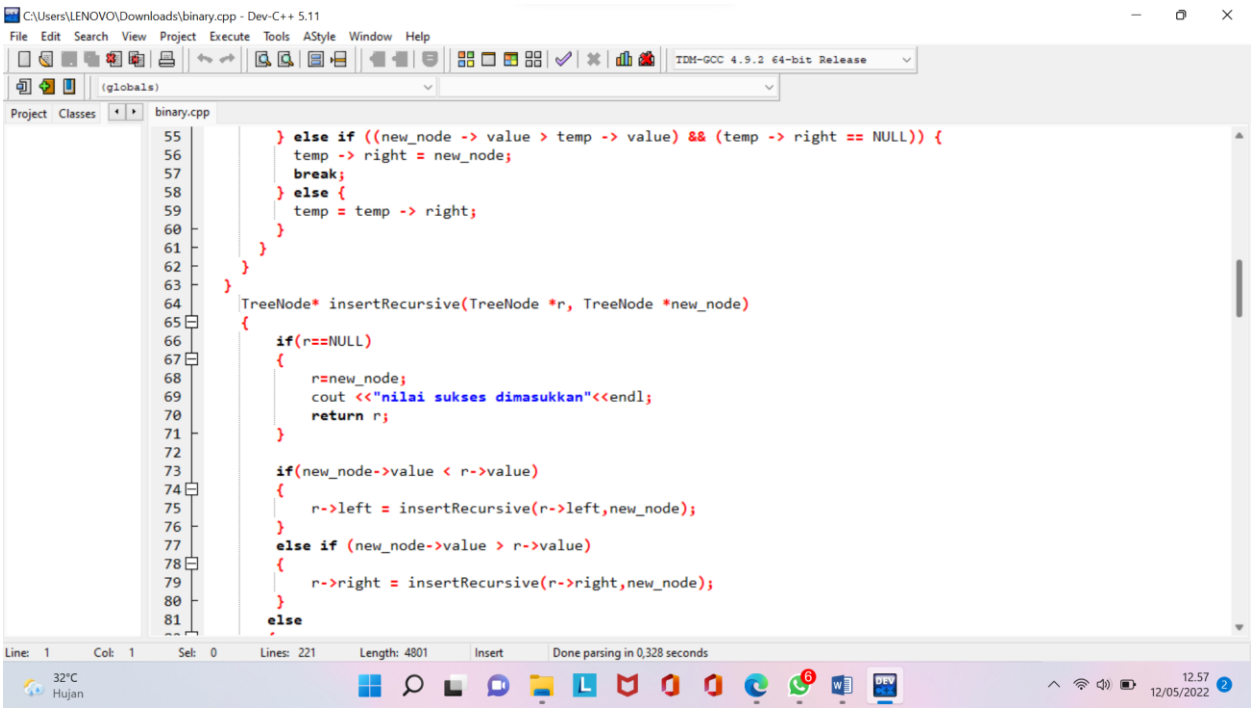
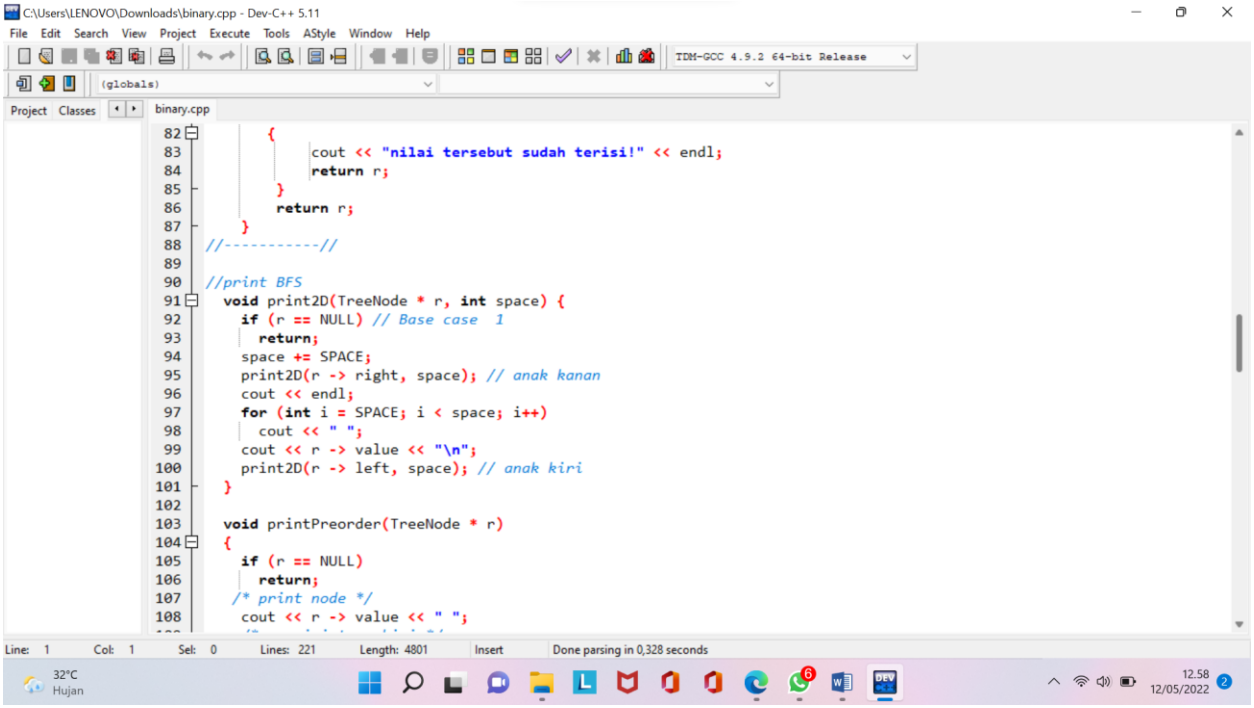
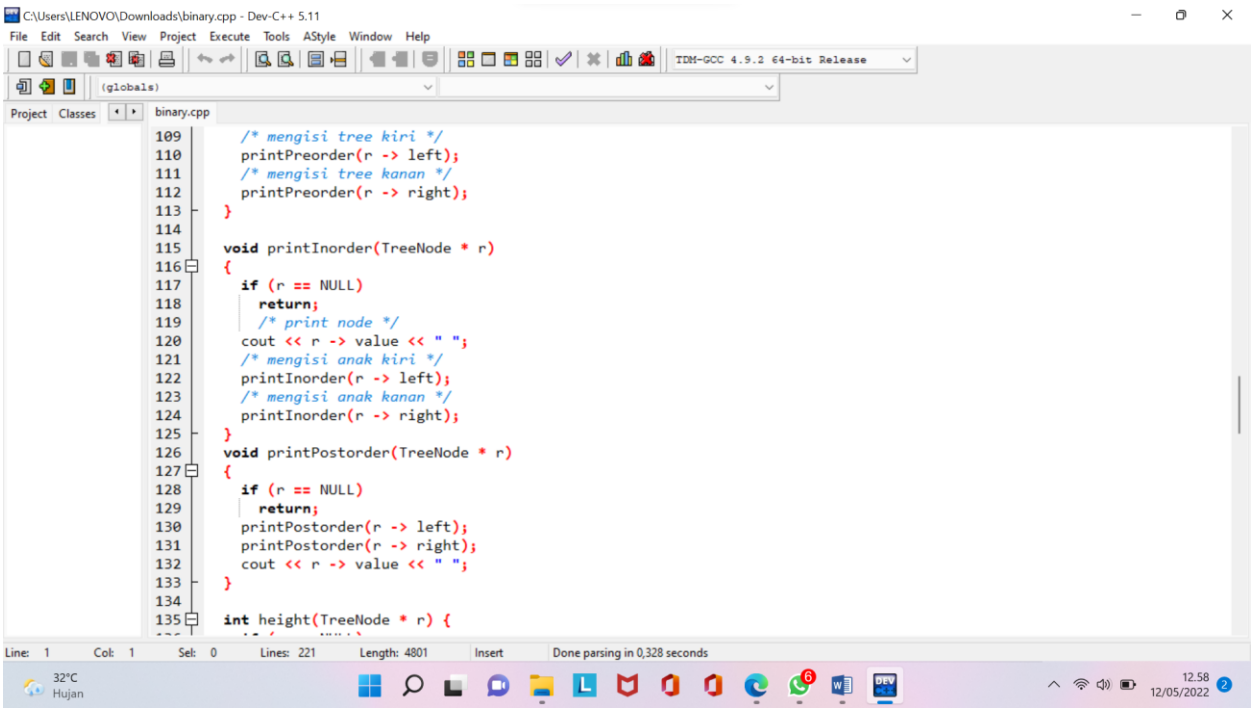
(globals)
Project Classes
binary.cpp
root = NULL;
}
bool isTreeEmpty() {
if (root == NULL) {
return true;
} else {
return false;
}
}
//----------//
//membuat fungsi penginputan node BST
void insertNode(TreeNode * new_node) {
if (root == NULL) {
root = new_node;
} else {
TreeNode * temp = root;
while (temp != NULL) {
if (new_node -> value == temp -> value) {
return;
} else if ((new_node -> value < temp -> value) && (temp -> left == NULL)) {
temp -> left = new_node;
break;
} else if (new_node -> value < temp -> value) {
temp = temp -> left;
Line: 1 Col: 1 Sel: 0 Lines: 221 Length: 4801 Insert Done parsing in 0,328 seconds
32°C Hujan
12.57 12/05/2022



```
55          } else if ((new_node -> value > temp -> value) && (temp -> right == NULL)) {
56            temp -> right = new_node;
57            break;
58          } else {
59            temp = temp -> right;
60          }
61        }
62      }
63    }
64      TreeNode* insertRecursive(TreeNode *r, TreeNode *new_node)
65      {
66          if(r==NULL)
67          {
68              r=new_node;
69              cout <<"nilai sukses dimasukkan"<<endl;
70              return r;
71          }
72
73          if(new_node->value < r->value)
74          {
75              r->left = insertRecursive(r->left,new_node);
76          }
77          else if (new_node->value > r->value)
78          {
79              r->right = insertRecursive(r->right,new_node);
80          }
81          else
```

```
82          {
83              cout << "nilai tersebut sudah terisi!" << endl;
84              return r;
85          }
86          return r;
87      }
88    //-----------//
89
90    //print BFS
91      void print2D(TreeNode * r, int space) {
92        if (r == NULL) // Base case  1
93          return;
94        space += SPACE;
95        print2D(r -> right, space); // anak kanan
96        cout << endl;
97        for (int i = SPACE; i < space; i++)
98          cout << " ";
99        cout << r -> value << "\n";
100       print2D(r -> left, space); // anak kiri
101   }
102
103   void printPreorder(TreeNode * r)
104   {
105     if (r == NULL)
106       return;
107    /* print node */
108     cout << r -> value << " ";
```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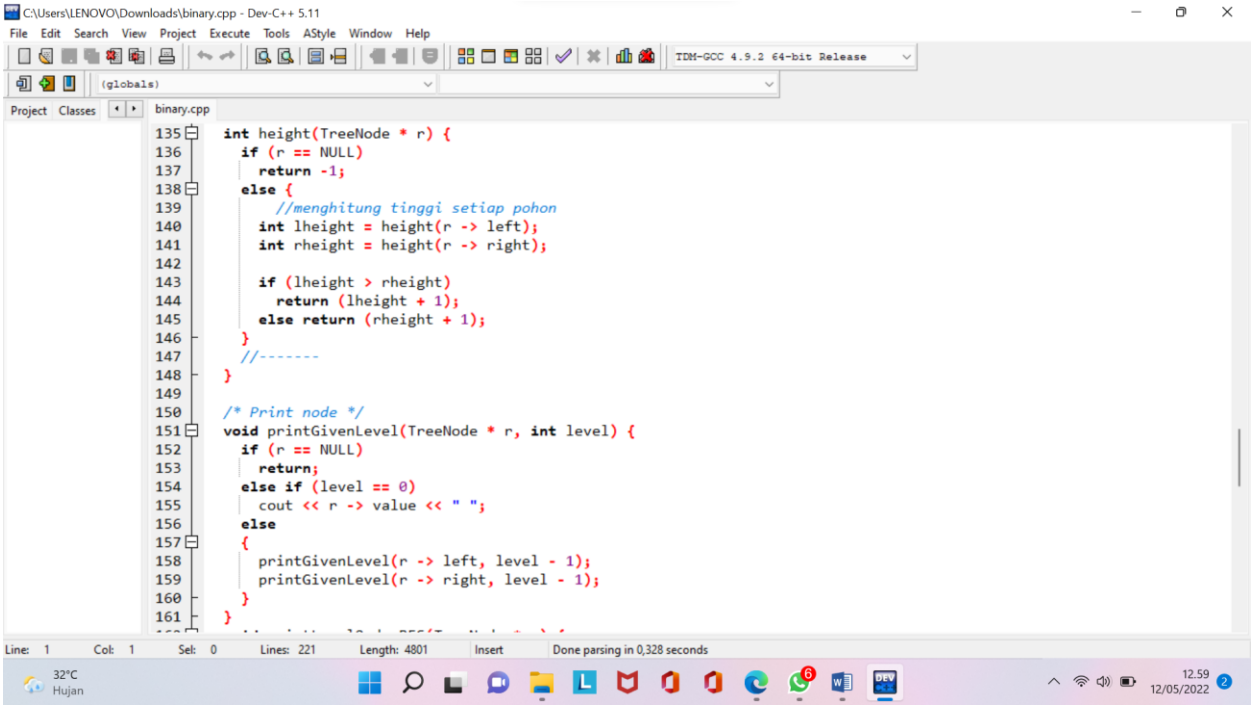
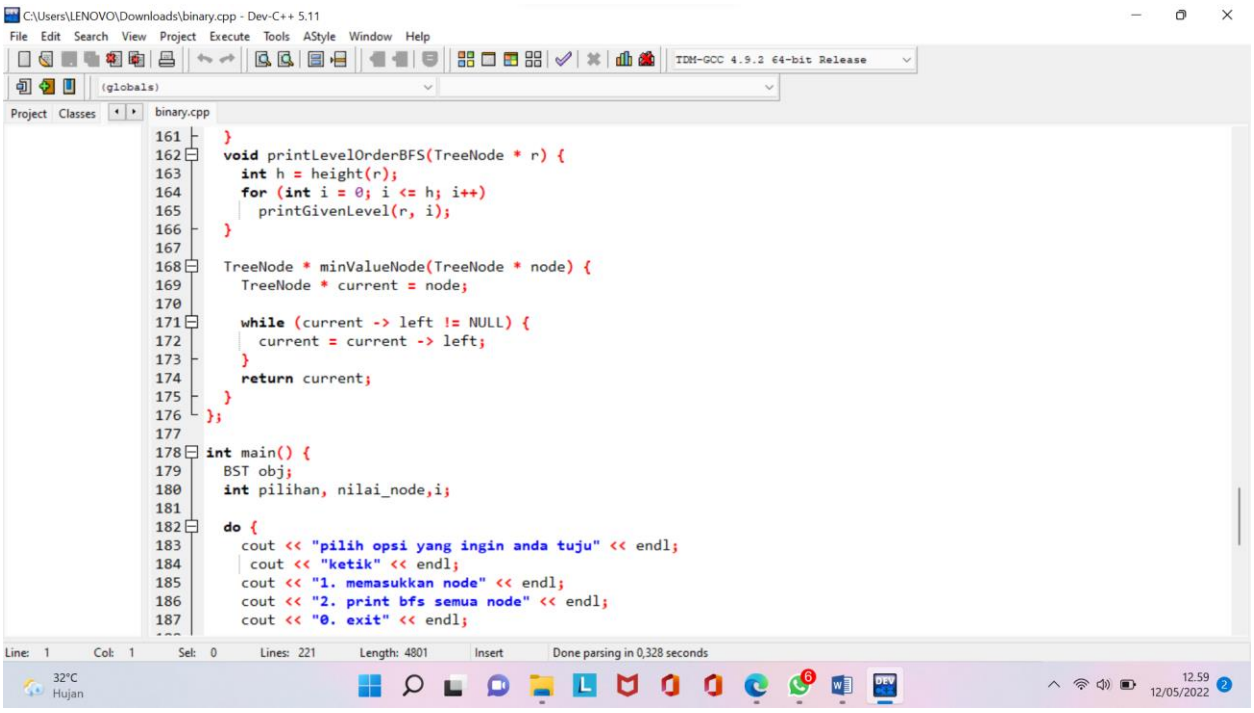
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes
binary.cpp
109 /* mengisi tree kiri */
110 printPreorder(r -> left);
111 /* mengisi tree kanan */
112 printPreorder(r -> right);
113 }
114
115 void printInorder(TreeNode * r)
116 {
117 if (r == NULL)
118 return;
119 /* print node */
120 cout << r -> value << " ";
121 /* mengisi anak kiri */
122 printInorder(r -> left);
123 /* mengisi anak kanan */
124 printInorder(r -> right);
125 }
126 void printPostorder(TreeNode * r)
127 {
128 if (r == NULL)
129 return;
130 printPostorder(r -> left);
131 printPostorder(r -> right);
132 cout << r -> value << " ";
133 }
134
135 int height(TreeNode * r) {
Line: 1 Col: 1 Sel: 0 Lines: 221 Length: 4801 Insert Done parsing in 0,328 seconds
32°C Hujan
12.58 12/05/2022


C:\Users\LENOVO\Downloads\binary.cpp - 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
binary.cpp
135 int height(TreeNode * r) {
136 if (r == NULL)
137 return -1;
138 else {
139 //menghitung tinggi setiap pohon
140 int lheight = height(r -> left);
141 int rheight = height(r -> right);
142
143 if (lheight > rheight)
144 return (lheight + 1);
145 else return (rheight + 1);
146 }
147 //-------
148 }
149
150 /* Print node */
151 void printGivenLevel(TreeNode * r, int level) {
152 if (r == NULL)
153 return;
154 else if (level == 0)
155 cout << r -> value << " ";
156 else
157 {
158 printGivenLevel(r -> left, level - 1);
159 printGivenLevel(r -> right, level - 1);
160 }
161 }
Line: 1 Col: 1 Sel: 0 Lines: 221 Length: 4801 Insert Done parsing in 0,328 seconds
32°C Hujan
12.59 12/05/2022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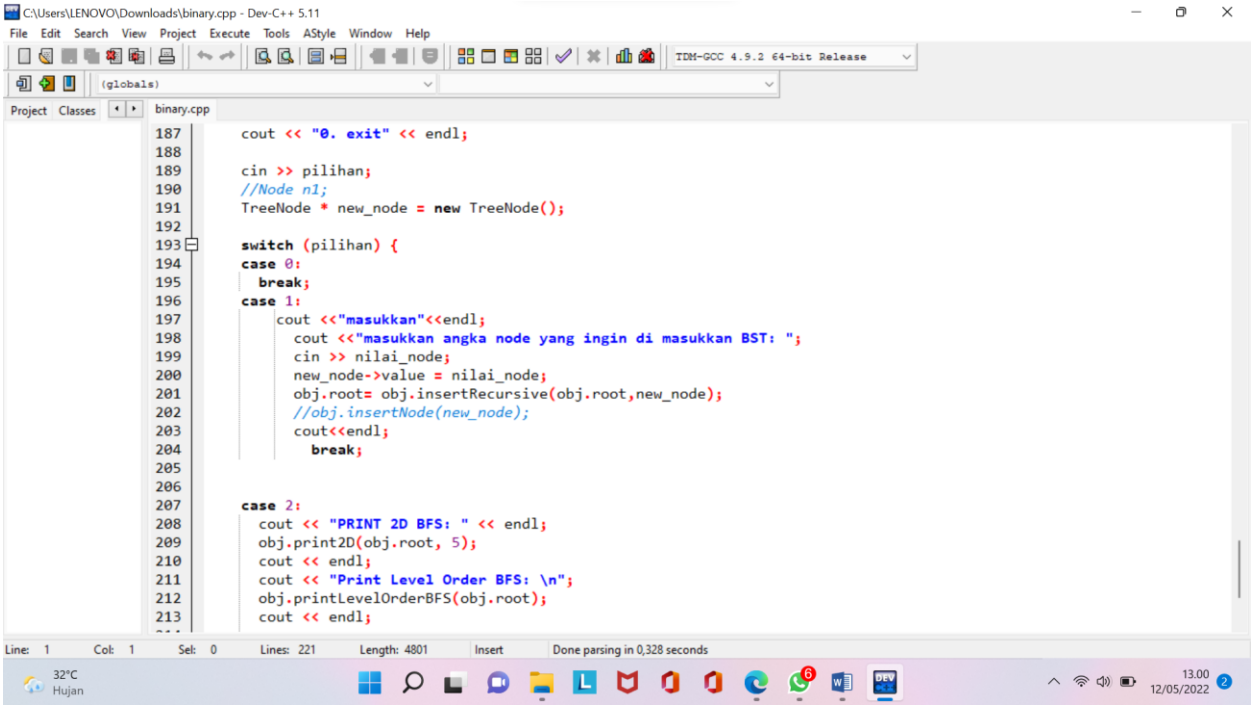
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes
binary.cpp
161 }
162 void printLevelOrderBFS(TreeNode * r) {
163 int h = height(r);
164 for (int i = 0; i <= h; i++)
165 printGivenLevel(r, i);
166 }
167
168 TreeNode * minValueNode(TreeNode * node) {
169 TreeNode * current = node;
170
171 while (current -> left != NULL) {
172 current = current -> left;
173 }
174 return current;
175 }
176 };
177
178 int main() {
179 BST obj;
180 int pilihan, nilai_node,i;
181
182 do {
183 cout << "pilih opsi yang ingin anda tuju" << endl;
184 cout << "ketik" << endl;
185 cout << "1. memasukkan node" << endl;
186 cout << "2. print bfs semua node" << endl;
187 cout << "0. exit" << endl;
Line: 1 Col: 1 Sel: 0 Lines: 221 Length: 4801 Insert Done parsing in 0,328 seconds
32°C Hujan
12.59 12/05/2022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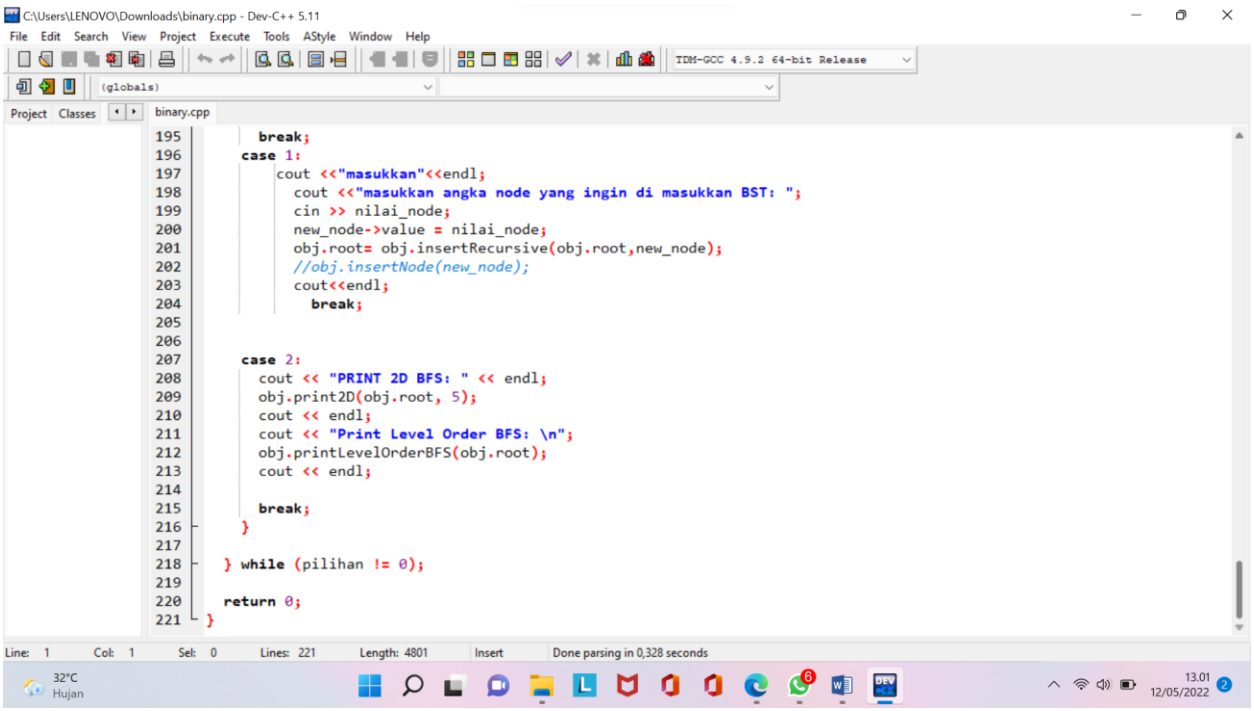
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes
binary.cpp
187 cout << "0. exit" << endl;
188
189 cin >> pilihan;
190 //Node n1;
191 TreeNode * new_node = new TreeNode();
192
193 switch (pilihan) {
194 case 0:
195 break;
196 case 1:
197 cout <<"masukkan"<<endl;
198 cout <<"masukkan angka node yang ingin di masukkan BST: ";
199 cin >> nilai_node;
200 new_node->value = nilai_node;
201 obj.root= obj.insertRecursive(obj.root,new_node);
202 //obj.insertNode(new_node);
203 cout<<endl;
204 break;
205
206
207 case 2:
208 cout << "PRINT 2D BFS: " << endl;
209 obj.print2D(obj.root, 5);
210 cout << endl;
211 cout << "Print Level Order BFS: \n";
212 obj.printLevelOrderBFS(obj.root);
213 cout << endl;
Line: 1 Col: 1 Sel: 0 Lines: 221 Length: 4801 Insert Done parsing in 0,328 seconds
32°C Hujan
13.00 12/05/2022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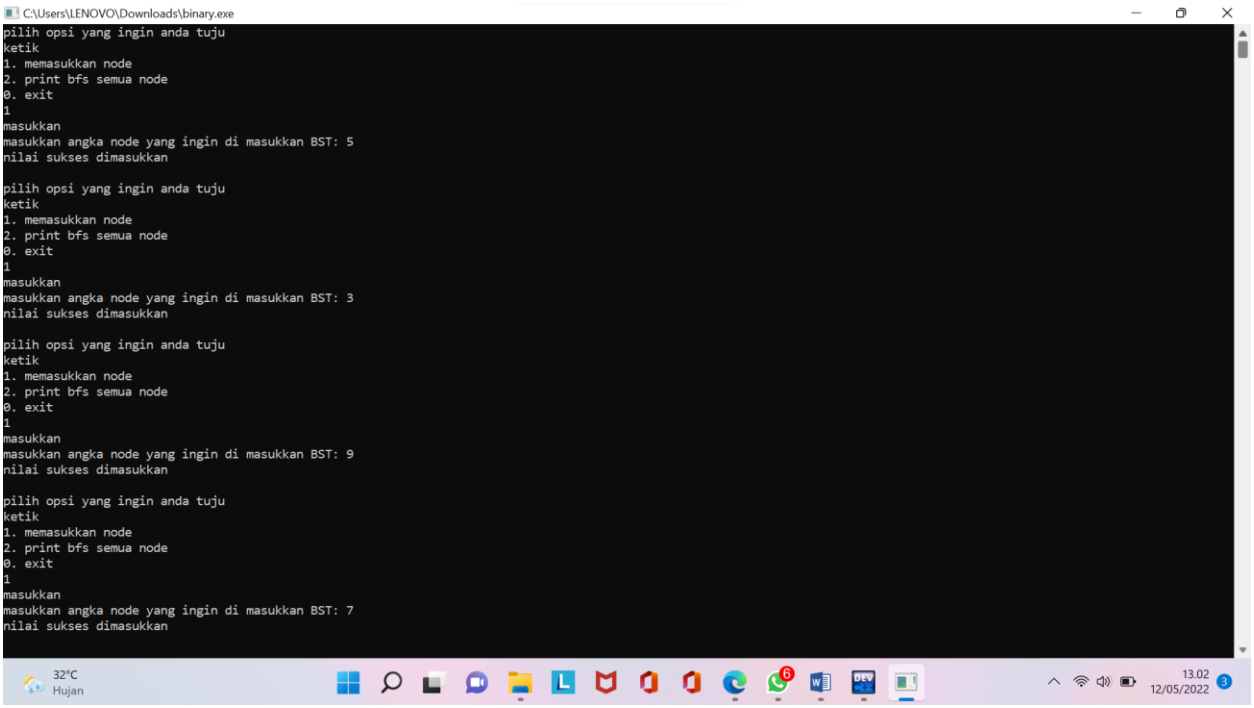
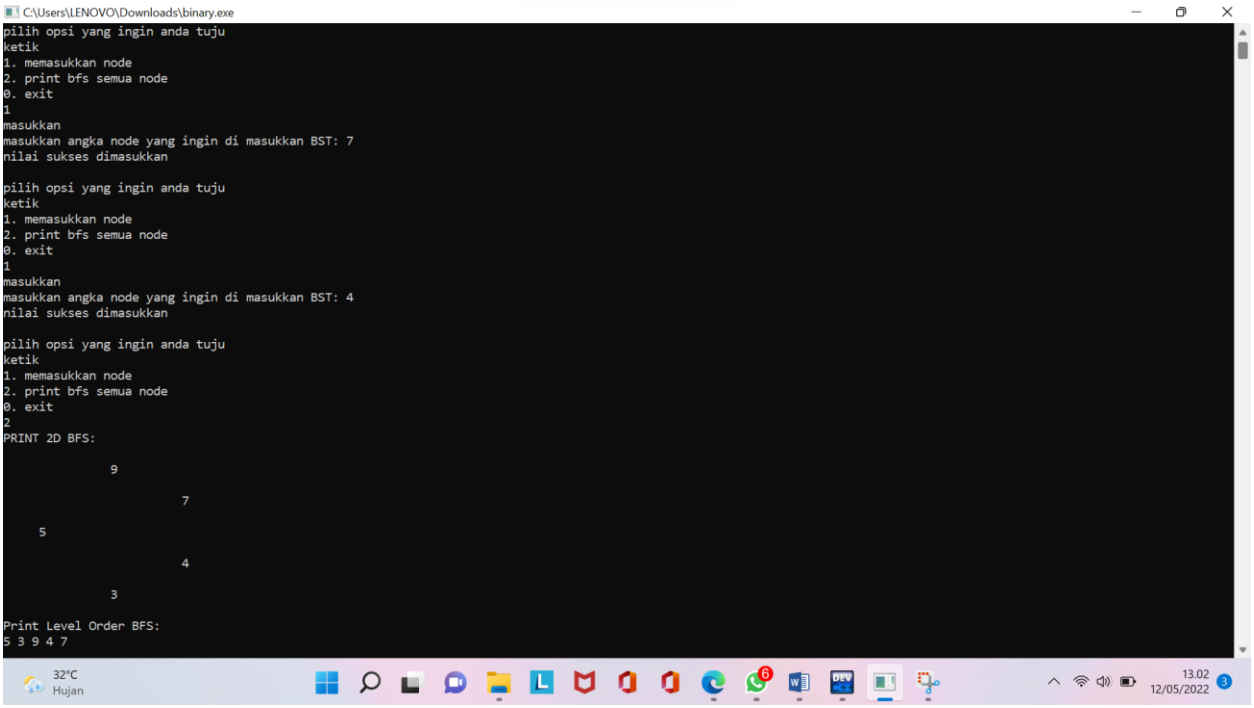
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes
binary.cpp
195 break;
196 case 1:
197 cout <<"masukkan"<<endl;
198 cout <<"masukkan angka node yang ingin di masukkan BST: ";
199 cin >> nilai_node;
200 new_node->value = nilai_node;
201 obj.root= obj.insertRecursive(obj.root,new_node);
202 //obj.insertNode(new_node);
203 cout<<endl;
204 break;
205
206
207 case 2:
208 cout << "PRINT 2D BFS: " << endl;
209 obj.print2D(obj.root, 5);
210 cout << endl;
211 cout << "Print Level Order BFS: \n";
212 obj.printLevelOrderBFS(obj.root);
213 cout << endl;
214
215 break;
216 }
217
218 } while (pilihan != 0);
219
220 return 0;
221 }
Line: 1 Col: 1 Sel: 0 Lines: 221 Length: 4801 Insert Done parsing in 0,328 seconds
32°C Hujan
13.01 12/05/2022

Hasil run


C:\Users\LENOVO\Downloads\binary.exe
pilih opsi yang ingin anda tuju
ketik
1. memasukkan node
2. print bfs semua node
0. exit
1
masukkan
masukkan angka node yang ingin di masukkan BST: 5
nilai sukses dimasukkan
pilih opsi yang ingin anda tuju
ketik
1. memasukkan node
2. print bfs semua node
0. exit
1
masukkan
masukkan angka node yang ingin di masukkan BST: 3
nilai sukses dimasukkan
pilih opsi yang ingin anda tuju
ketik
1. memasukkan node
2. print bfs semua node
0. exit
1
masukkan
masukkan angka node yang ingin di masukkan BST: 9
nilai sukses dimasukkan
pilih opsi yang ingin anda tuju
ketik
1. memasukkan node
2. print bfs semua node
0. exit
1
masukkan
masukkan angka node yang ingin di masukkan BST: 7
nilai sukses dimasukkan
32°C Hujan
13.02 12/05/2022


C:\Users\LENOVO\Downloads\binary.exe
pilih opsi yang ingin anda tuju
ketik
1. memasukkan node
2. print bfs semua node
0. exit
1
masukkan
masukkan angka node yang ingin di masukkan BST: 7
nilai sukses dimasukkan
pilih opsi yang ingin anda tuju
ketik
1. memasukkan node
2. print bfs semua node
0. exit
1
masukkan
masukkan angka node yang ingin di masukkan BST: 4
nilai sukses dimasukkan
pilih opsi yang ingin anda tuju
ketik
1. memasukkan node
2. print bfs semua node
0. exit
2
PRINT 2D BFS:
9
7
5
4
3
Print Level Order BFS:
5 3 9 4 7
32°C
Hujan
13.02
12/05/2022