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Roll.no : 2019115126

1.Create a class to create a stack with push and pop operations. Also find out the largest element present in the stack by overloading > operator

main.cpp

```
#include <iostream>
#include "stack.h"
using namespace std;

int main() {
    typedef stk<num> numstack;
    int sz=0;
    num n;
    cout<<"\n\n    num numstk a class having an integer as its private data";
    cout<<"\n\n    enter size of stack of nums  "; cin>>sz;
    numstack numstk(sz);
    int i = 0,j=0;

    cout << "\n\n    Pushing elements onto stack of nums" << endl;

    for(j;j<sz;j++)
    {
        cout<<" \n\n    enter element to push  ";
        cin>>i;
        numstk.push(num(i));
    }

    cout << "\n\n    stack numstk full \n" ;
```

```
cout<<"\n\n    num has an over loaded > operator";  
cout << "\n\n    ((num(5)>num(6))? num(5):num(6) ) = " << ((num(5)>num(6))? num(5):num(6)  
)<< endl;  
  
cout<<"\n\n    using this feature, greatest element in the stack numstack : "<< numstk.largest() <<  
endl;  
  
cout<<"\n\n    popping elements\n\n";  
while (numstk.pop(n))  
    cout <<"\n\n popped   " <<n ;  
  
cout << "\n\n\n stack numstack empty \n\n" << endl;  
  
return 0;  
  
}
```

stack.h

```
#ifndef STACK_H
#define STACK_H

#include<iostream>
using namespace std;

class num
{
private:
    int i=0;
public:
    num(num& n2);

    num(int j=0);

    int operator>(const num& n);

    void operator=(const num& n);

    friend ostream& operator<<(ostream& out,const num& a);

    friend istream& operator>>(istream& in,const num& a);
```

```
};
```

```
template <class T>
```

```
class stk {
```

```
private:
```

```
    T* stkptr;
```

```
    int size;
```

```
    int top;
```

```
public:
```

```
    stk(int = 10);
```

```
    int push(const T&);
```

```
    int pop(T&);
```

```
    int underflow() const { return top == -1; }
```

```
    int overflow() const { return top == size - 1; }
```

```
    const T& largest();
```

```
~stk() { delete [] stkptr ; }
```

```
};
```

```
#endif
```

stack.cpp

```
#include "stack.h"
#include<iostream>
using namespace std;

num::num(num& n2)
{
    i=n2.i;

}

num::num(int j)
{
    i=j;

}

int num::operator>(const num& n)
{
    return (i>n.i);

}

void num::operator=(const num& n)
```

```
{  
    i=n.i;
```

```
}
```

```
ostream& operator<<(ostream& out,const num& a)  
{ out<<a.i;return out;}
```

```
istream& operator>>(istream& in,const num& a)  
{ in>>a.i;return in;}
```

```
template <class T>  
stk<T>::stk(int s) {  
    size = s > 0 && s < 1000 ? s : 10;  
    top = -1 ;  
    stkptr = new T[size];  
}
```

```
template <class T>  
int stk<T>::push(const T& itemval) {  
    if (!overflow()) {  
        stkptr[++top] = itemval;  
        return 1;
```

```
}
```

```
return 0;
```

```
}
```

```
template <class T>
```

```
int stk<T>::pop(T& val) {
```

```
    if (!underflow()) {
```

```
        val = stkptr[top--];
```

```
        return 1;
```

```
}
```

```
    return 0;
```

```
}
```

```
template <class T>
```

```
const T& stk<T>::largest()
```

```
{
```

```
    T large; int largeindex;
```

```
    large=stkptr[0];
```

```
    for(int i=1;i<size;i++)
```

```
{
```

```
        if(stkptr[i]>large)
```

```
{
```

```
            large=stkptr[i];
```

```
            largeindex=i;
```

```
}
```

```
}
```

```
return stkptr[largeindex];
```

```
}
```

```
template class stk<num>;
```

Project4 - [Project4.dev] - Dev-C++ 5.11

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TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

72
73
74     template <class T>
75     const T& stk<T>::largest()
76     {
77         T large;int largeindex;
78         large=stkptr[0];
79         for(int i=1;i<size;i++)
80         {
81             if(stkptr[i]>large)
82             {
83                 large=stkptr[i];
84                 largeindex=i;
85             }
86         }
87     }
88
89     return stkptr[largeindex];
90
91
92 }
```

Compiler Resources Compile Log Debug Find Results (2) Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\ql\Project4.exe
- Output Size: 1.97860908508301 MiB
- Compilation Time: 2.14s

Line: 54 Col: 17 Sel: 0 Lines: 102 Length: 1387 Insert Done parsing in 0.032 seconds

Type here to search

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TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

61
62     template <class T>
63     int stk<T>::pop(T& val) {
64         if (!underflow())
65         {
66             val = stkptr[top--];
67             return 1;
68         }
69         return 0;
70
71
72
73
74     template <class T>
75     const T& stk<T>::largest()
76     {
77         T large;int largeindex;
78         large=stkptr[0];
79         for(int i=1;i<size;i++)
80         {
81             if(stkptr[i]>large)
82             {
83                 large=stkptr[i];
84                 largeindex=i;
85             }
86         }
87     }
88
89     return stkptr[largeindex];
90
91
92 }
```

Compiler Resources Compile Log Debug Find Results (2) Close

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TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

61
62     template <class T>
63     int stk<T>::pop(T& val) {
64         if (!underflow())
65         {
66             val = stkptr[top--];
67             return 1;
68         }
69         return 0;
70
71
72
73
74     template <class T>
75     const T& stk<T>::largest()
76     {
77         T large;int largeindex;
78         large=stkptr[0];
79         for(int i=1;i<size;i++)
80         {
81             if(stkptr[i]>large)
82             {
83                 large=stkptr[i];
84                 largeindex=i;
85             }
86         }
87     }
88
89     return stkptr[largeindex];
90
91
92 }
```

Compiler Resources Compile Log Debug Find Results (2) Close

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TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

42
43
44     template <class T>
45     stk<T>::stk(int s) {
46         size = s > 0 && s < 1000 ? s : 10;
47         top = -1;
48         stkptr = new T[size];
49     }
50
51
52     template <class T>
53     int stk<T>::push(const T& itemval) {
54         if (!overflow())
55             stkptr[++top] = itemval;
56         return 1;
57     }
58     return 0;
59 }
60
61
62     template <class T>
63     int stk<T>::pop(T& val) {

```

Compiler Resources Compile Log Debug Find Results (2) Close

About Compilation

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TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

18
19     }
20
21     int num::operator>(const num& n)
22     {
23         return (i>n.i);
24     }
25     void num::operator=(const num& n)
26     {
27         i=n.i;
28     }
29
30
31
32
33     ostream& operator<<(ostream& out, const num& a)
34     { out<<a.i;return out;}
35
36     istream& operator>>(istream& in, const num& a)
37     { in>>a.i;return in;}
38
39

```

Compiler Resources Compile Log Debug Find Results (2) Close

About Compilation

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Line: 54 Col: 17 Sel: 0 Lines: 102 Length: 1387 Insert Done parsing in 0.032 seconds

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TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

1 #include "stack.h"
2 #include<iostream>
3 using namespace std;
4
5
6
7
8     num::num(num& n2)
9     {
10         i=n2.i;
11     }
12     num::num(int j)
13     {
14         i=j;
15     }
16     int num::operator>(const num& n)
17     {
18         return (i>n.i);
19     }
20 
```

Compiler Resources CompileLog Debug Find Results (2) Close

About Compilation

Compilation results...

- Errors: 0
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- Output Filename: D:\dev\ql\Project4.exe
- Output Size: 1.97860908508301 MiB
- Compilation Time: 2.14s

Line: 54 Col: 17 Sel: 0 Lines: 102 Length: 1387 Insert Done parsing in 0.032 seconds

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Project4 - [Project4.dev] - Dev-C++ 5.11

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TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

41     int top;
42
43     public:
44         stk(int = 10);
45
46         int push(const T&);
47
48         int pop(T&);
49
50         int underflow() const { return top == -1; }
51
52         int overflow() const { return top == size - 1; }
53
54         const T& largest();
55
56         ~stk() { delete [] stkptr; }
57
58     };
59 #endif
60 
```

Compiler Resources CompileLog Debug Find Results (2) Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\ql\Project4.exe
- Output Size: 1.97860908508301 MiB
- Compilation Time: 2.14s

Line: 49 Col: 7 Sel: 0 Lines: 61 Length: 805 Insert Done parsing in 0.032 seconds

Type here to search

Project4 - [Project4.dev] - Dev-C++ 5.11

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TIFF-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

33
34 template <class T>
35 class stk {
36     private:
37         T* stkptr;
38
39     int size;
40
41     int top;
42
43     public:
44         stk(int = 10);
45
46         int push(const T&);
47
48         int pop(T&);
49         |
50         int underflow() const { return top == -1; }
51
52         int overflow() const { return top == size - 1; }
53
54         const T& largest();

```

Compiler Resources CompileLog Debug Find Results (2) Close

About Compilation

Compilation results...

- Errors: 0
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- Output Filename: D:\dev\ql\Project4.exe
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- Compilation Time: 2.14s

Type here to search

Line: 49 Col: 7 Sel: 0 Lines: 61 Length: 805 Insert Done parsing in 0.032 seconds

Project4 - [Project4.dev] - Dev-C++ 5.11

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TIFF-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

12 num(num& n2);
13
14 num(int j=0);
15
16 int operator>(const num& n);
17
18 void operator=(const num& n);
19
20
21 friend ostream& operator<<(ostream& out,const num& a);
22
23
24 friend istream& operator>>(istream& in,const num& a);
25
26
27
28 };
29
30
31
32
33

```

Compiler Resources CompileLog Debug Find Results (2) Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\ql\Project4.exe
- Output Size: 1.97860908508301 MiB
- Compilation Time: 2.14s

Type here to search

Line: 49 Col: 16 Sel: 0 Lines: 52 Length: 747 Insert Done parsing in 0.015 seconds

Project4 - [Project4.dev] - Dev-C++ 5.11

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TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

1 #ifndef STACK_H
2 #define STACK_H
3
4 #include<iostream>
5 using namespace std;
6
7 class num
8 {
9     private:
10     int i=0;
11     public:
12     num(num& n2);
13
14     num(int j=0);
15
16     int operator>(const num& n);
17
18     void operator=(const num& n);
19
20
21     friend ostream& operator<<(ostream& out,const num& a);
22 }
```

Compiler Resources CompileLog ✓ Debug Find Results (2) Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\ql\Project4.exe
- Output Size: 1.97860908508301 MiB
- Compilation Time: 2.14s

Line: 49 Col: 16 Sel: 0 Lines: 52 Length: 747 Insert Done parsing in 0.015 seconds

Type here to search

File Edit Search View Project Execute Tools AStyle Window Help

TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

19 cin>>i;
20 numstk.push(num(i));
21 }
22
23 cout << "\n\n      stack numstk full \n" ;
24
25 cout<<"\n\n      num has an over loaded > operator";
26 cout << "\n\n      ((num(5)>num(6))? num(5):num(6) ) = " << ((num(5)>num(6))? num(5):num(6) )<< endl;
27 cout<<"\n\n      using this feature, greatest element in the stack numstack : " << numstk.largest() << endl;
28
29 cout<<"\n\n      popping elements\n\n";
30 while (numstk.pop(n))
31 | cout <<"\n\n popped   " << n ;
32
33 cout << "\n\n\n      stack numstack empty \n\n" << endl;
34
35
36
37
38
39 }
```

Compiler Resources CompileLog ✓ Debug Find Results (2) Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\ql\Project4.exe
- Output Size: 1.97860908508301 MiB
- Compilation Time: 2.14s

Line: 1 Col: 1 Sel: 0 Lines: 39 Length: 1056 Insert Done parsing in 0.015 seconds

Type here to search

Project4 - [Project4.dev] - Dev-C++ 5.11

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TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

14
15     for(j;j<sz;j++)
16    {
17
18        cout<< "\n\n      enter element to push  ";
19        cin>>i;
20        numstk.push(num(i));
21    }
22
23    cout << "\n\n      stack numstk full \n" ;
24
25    cout<<"\n\n      num has an over loaded > operator";
26    cout << "\n\n      ((num(5)>num(6))? num(5):num(6) ) = " << ((num(5)>num(6))? num(5):num(6) )<< endl;
27    cout<<"\n\n      using this feature, greatest element in the stack numstack : " << numstk.largest() << endl;
28
29    cout<<"\n\n      popping elements\n\n";
30    while (numstk.pop(n))
31    | cout <<"\n\n      popped   " <<n ;
32
33    cout << "\n\n      stack numstack empty \n\n" << endl;
34
35    return 0;

```

Compiler Resources CompileLog ✓ Debug Find Results (2) Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\ql\Project4.exe
- Output Size: 1.97860908508301 MiB
- Compilation Time: 2.14s

Line: 1 Col: 1 Sel: 0 Lines: 39 Length: 1056 Insert Done parsing in 0.015 seconds 16:44 09-04-2021

Project4 - [Project4.dev] - Dev-C++ 5.11

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TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

```

1 #include <iostream>
2 #include "stack.h"
3 using namespace std;
4 int main()
5 {
6     typedef stk<num> numstack;
7     int sz=0;
8     num n;
9     cout<<"\n\n      num numstk a class having an integer as its private data";
10    cout<<"\n\n      enter size of stack of nums "; cin>>sz;
11    numstack numstk(sz);
12    int i = 0,j=0;
13
14    cout << "\n\n      Pushing elements onto stack of nums" << endl;
15
16    for(j;j<sz;j++)
17    {
18
19        cout<<"\n\n      enter element to push  ";
20        cin>>i;
21        numstk.push(num(i));
22    }

```

Compiler Resources CompileLog ✓ Debug Find Results (2) Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\ql\Project4.exe
- Output Size: 1.97860908508301 MiB
- Compilation Time: 2.14s

Line: 1 Col: 1 Sel: 0 Lines: 39 Length: 1056 Insert Done parsing in 0.015 seconds 16:44 09-04-2021

Project4 - [Project4.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp stack.h stack.cpp

82 if(stkptr[i]>large)
83 {
84 large=stkptr[i];
85 largeindex=i;
86 }
87
88 }
89
90 return stkptr[largeindex];
91
92
93
94
95 }
96
97
98
99
100 template class stk<num>;
101
102

Compiler Resources Compile Log Debug Find Results (2) Close

About Compilation

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Line: 54 Col: 17 Sel: 0 Lines: 102 Length: 1387 Insert Done parsing in 0.032 seconds

Type here to search

16:46 09-04-2021

```
D:\dev\q1\Project4.exe
num numstk a class having an integer as its private data
enter size of stack of nums 5

Pushing elements onto stack of nums

enter element to push 6
enter element to push 3
enter element to push 2
enter element to push 8
enter element to push 7

stack numstk full

num has an over loaded > operator
((num(5)>num(6))? num(5):num(6) ) = 6

using this feature, greatest element in the stack numstack : 8

popping elements

popped 7
popped 8
popped 2
popped 3
popped 6
```

```
D:\dev\q1\Project4.exe
enter element to push 6
enter element to push 3
enter element to push 2
enter element to push 8
enter element to push 7

stack numstk full

num has an over loaded > operator
((num(5)>num(6))? num(5):num(6) ) = 6

using this feature, greatest element in the stack numstack : 8

popping elements

popped 7
popped 8
popped 2
popped 3
popped 6

stack numstack empty

Process exited after 19.29 seconds with return value 0
Press any key to continue . . .
```

```
D:\dev\q1\Project4.exe
num numstk a class having an integer as its private data
enter size of stack of nums 4

Pushing elements onto stack of nums

enter element to push 3

enter element to push 7

enter element to push 2

enter element to push 9

stack numstack full

num has an over loaded > operator
((num(5)>num(6))? num(5):num(6) ) = 6

using this feature, greatest element in the stack numstack : 9

popping elements

popped 9
popped 2
popped 7
popped 3

stack numstack empty

Process exited after 17.29 seconds with return value 0
```

Windows Taskbar showing various pinned icons and system status.

2.Create a class for Binary Search Tree with suitable member functions for insertion, deletion and search. Also implement preorder, in order and post order traversals for the search tree constructed. (Use Header, implementation and main as three different files)

Main.cpp

```
#include <iostream>

using namespace std;
#include "tree.h"

int main()
{
    tree<int> tree_obj;int c;
    cout<<"\n\n\n";
    while(1){
        cout<<"\n\n    enter node to insert,-1 to exit :  ";
        cin>>c;
        if (c== -1) break;

        tree_obj.insertNode(c);
    }
    c=0;
    cout<<"\n\n";
    cout<<"\n\n    in-order:      ";
    tree_obj.InOrder();
```

```
cout<<"\n\n\n\n    post order:    ";
tree_obj.PostOrder();

cout<<"\n\n\n\n    pre order:    ";
tree_obj.PreOrder();

cout<<"\n\n\n";
while(1){

cout<<"\n\n    enter node to delete,-1 to exit :   ";
cin>>c;
if (c==-1) break;
if(tree_obj.searchNode(c)!=1)
{cout<<"\n\n    not present\n";continue;}
tree_obj.remove(c);

}

c=0;
cout<<"\n\n";
cout<<"\n\n    in-order:    ";
tree_obj.InOrder();

cout<<"\n\n\n\n    post order:    ";
tree_obj.PostOrder();

cout<<"\n\n\n\n    pre order:    ";
tree_obj.PreOrder();

cout<<"\n\n\n";
while(1)
```

```
{  
    cout<<"\n\n    enter node to search for,-1 to exit :  ";  
    cin>>c;  
    if(c== -1) break;  
  
    if(tree_obj.searchNode(c)==1)  
    {cout<<"\n\n    present\n";}  
  
    else {cout<<"\n\n    not present\n";}  
  
    cout<< " \n\n    exited \n\n ";  
  
    return 0;  
}
```

Tree.h

```
#ifndef TREE_H
#define TREE_H
#include <iostream>
using namespace std;

template <class T>
class tree
{
public:
    struct node
    {
        T value;
        node *left;
        node *right;
    };
    node *root;
};

void insert(node *&, node *&);

void destroySubTree(node *);

void delnode(T, node *&);
```

```
void mkdel(node *&);
```

```
void InOrder(node *);
```

```
void PreOrder(node *);
```

```
void PostOrder(node *);
```

```
public:
```

```
tree()
```

```
{ root = NULL; }
```

```
~tree()
```

```
{ destroySubTree(root); }
```

```
void insertNode(T);
```

```
int searchNode(T);
```

```
void remove(T);
```

```
void InOrder()
```

```
{ InOrder(root); }
```

```
void PreOrder()
```

```
{ PreOrder(root); }
```

```
void PostOrder()
```

```
{ PostOrder(root); }
```

```
};
```

```
#endif
```

Tree.cpp

```
#include "tree.h"
#include <iostream>

using namespace std;

template <class T>
void tree<T>::insert(node *&nodeptr, node *&newNode)
{
    if (nodeptr == NULL)
    {
        nodeptr = newNode;
    }
    else if (newNode->value < nodeptr->value)
    {
        insert(nodeptr->left, newNode);
    }
    else
    {
        insert(nodeptr->right, newNode);
    }
}

template <class T>
void tree<T>::insertNode(T num)
{
```

```
node *newNode = NULL;  
newNode = new node;  
newNode->value = num;  
newNode->left = newNode->right = NULL;  
  
insert(root, newNode);  
}
```

```
template <class T>  
void tree<T>::destroySubTree(node *nodeptr)  
{  
    if (nodeptr->left)  
    {  
        destroySubTree(nodeptr->left);  
    }  
    if (nodeptr->right)  
    {  
        destroySubTree(nodeptr->right);  
    }  
    delete nodeptr;  
}
```

```
template <class T>  
int tree<T>::searchNode(T num)  
{
```

```
int status =0;  
node *nodeptr = root;  
while (nodeptr!=NULL)  
{  
if (nodeptr->value == num)  
{  
status = 1;  
break;  
}  
else if (num < nodeptr->value)  
{  
nodeptr = nodeptr->left;  
}  
else  
{  
nodeptr = nodeptr->right;  
  
}  
}  
return status;  
}
```

```
template <class T>  
void tree<T>::remove(T num)  
{  
delnode(num, root);  
}
```

```
template <class T>
```

```
void tree<T>::delnode(T num, node *&nodeptr)
{
    if (num < nodeptr->value)
    {
        delnode(num, nodeptr->left);
    }
    else if (num > nodeptr->value)
    {
        delnode(num, nodeptr->right);
    }
    else
    {
        mkdel(nodeptr);
    }
}
```

```
template <class T>
void tree<T>::mkdel(node *&nodeptr)
{
    node *temp = NULL;
    if (nodeptr == NULL)
    {
        cout << "Cannot delete empty node.\n";
    }
    else if (nodeptr->right == NULL)
    {
        temp = nodeptr;
        nodeptr = nodeptr->left;
        delete temp;
    }
}
```

```
else if (nodeptr->left == NULL)
{
    temp = nodeptr;
    nodeptr = nodeptr->right;
    delete temp;
}

else
{
    temp = nodeptr->right;

    while (temp->left)
    {
        temp = temp->left;
    }

    temp->left = nodeptr->left;
    temp = nodeptr;

    nodeptr = nodeptr->right;
    delete temp;
}

}

template <class T>
void tree<T>::InOrder(node *nodeptr)
{
    if (nodeptr)
```

```
{  
    InOrder(nodeptr->left);  
    cout << nodeptr->value << " ";  
    InOrder(nodeptr->right);  
}  
}
```

```
template <class T>  
void tree<T>::PreOrder(node *nodeptr)  
{  
    if (nodeptr)  
    {  
        cout << nodeptr->value << " ";  
        PreOrder(nodeptr->left);  
        PreOrder(nodeptr->right);  
    }  
}
```

```
template <class T>  
void tree<T>::PostOrder(node *nodeptr)  
{  
    if (nodeptr)  
    {  
        PostOrder(nodeptr->left);  
        PostOrder(nodeptr->right);  
        cout << nodeptr->value << " ";  
    }  
}
```

```
template class tree<int>;
```

The screenshot displays two instances of the Dev-C++ IDE interface, showing the development environment for a C++ project named "Project2".

Top Window:

- Project View:** Shows the project structure with files: main.cpp, tree.h, and tree.cpp.
- Code Editor:** Displays the following code for tree.h:

```
159
160
161 template <class T>
162 void tree<T>::PreOrder(node *nodeptr)
163 {
164     if (nodeptr)
165     {
166         cout << nodeptr->value << " ";
167         PreOrder(nodeptr->left);
168         PreOrder(nodeptr->right);
169     }
170 }
171
172 template <class T>
173 void tree<T>::PostOrder(node *nodeptr)
174 {
175     if (nodeptr)
176     {
177         PostOrder(nodeptr->left);
178         PostOrder(nodeptr->right);
179         cout << nodeptr->value << " ";
180     }
}
```

Bottom Window:

- Project View:** Shows the project structure with files: main.cpp, tree.h, and tree.cpp.
- Code Editor:** Displays the following code for tree.h:

```
145
146
147 }
148
149 template <class T>
150 void tree<T>::InOrder(node *nodeptr)
151 {
152     if (nodeptr)
153     {
154         InOrder(nodeptr->left);
155         cout << nodeptr->value << " ";
156         InOrder(nodeptr->right);
157     }
158 }
159
160
161 template <class T>
162 void tree<T>::PreOrder(node *nodeptr)
163 {
164     if (nodeptr)
165     {
166         cout << nodeptr->value << " ";
```

Common UI Elements: Both windows share a common toolbar at the top with icons for file operations, project management, and compilation. Status bars at the bottom indicate the current line (107), column (1), selection (0), and total lines (186). The bottom status bar also shows the date (09-04-2021) and time (18:47). A taskbar at the very bottom lists various application icons.

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

124     temp = nodeptr;
125     nodeptr = nodeptr->right;
126     delete temp;
127 }
128
129 else
130 {
131
132     temp = nodeptr->right;
133
134     while (temp->left)
135     {
136         temp = temp->left;
137     }
138
139     temp->left = nodeptr->left;
140     temp = nodeptr;
141
142     nodeptr = nodeptr->right;
143     delete temp;
144 }
```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Type here to search

Line: 107 Col: 1 Sel: 0 Lines: 186 Length: 2445 Insert Done parsing in 0.015 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

107
108     template <class T>
109     void tree<T>::madel(node *&nodeptr)
110     {
111         node *temp = NULL;
112         if (nodeptr == NULL)
113         {
114             cout << "Cannot delete empty node.\n";
115         }
116         else if (nodeptr->right == NULL)
117         {
118             temp = nodeptr;
119             nodeptr = nodeptr->left;
120             delete temp;
121         }
122         else if (nodeptr->left == NULL)
123         {
124             temp = nodeptr;
125             nodeptr = nodeptr->right;
126             delete temp;
127         }
128 }
```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Type here to search

Line: 107 Col: 1 Sel: 0 Lines: 186 Length: 2445 Insert Done parsing in 0.015 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

93 if (num < nodeptr->value)
94 {
95     delnode(num, nodeptr->left);
96 }
97 else if (num > nodeptr->value)
98 {
99     delnode(num, nodeptr->right);
100}
101else
102{
103    mkdel(nodeptr);
104}
105
106
107|
108template <class T>
109void tree<T>::mkdel(node *&nodeptr)
110{
111    node *temp = NULL;
112    if (nodeptr == NULL)
113    {
114        cout << "Cannot delete empty node.\n";

```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Type here to search

Line: 107 Col: 1 Sel: 0 Lines: 186 Length: 2445 Insert Done parsing in 0.015 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

84 void tree<T>::remove(T num)
85 {
86     delnode(num, root);
87 }
88
89
90 template <class T>
91 void tree<T>::delnode(T num, node *&nodeptr)
92 {
93     if (num < nodeptr->value)
94     {
95         delnode(num, nodeptr->left);
96     }
97     else if (num > nodeptr->value)
98     {
99         delnode(num, nodeptr->right);
100}
101else
102{
103    mkdel(nodeptr);
104}
105

```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Type here to search

Line: 139 Col: 1 Sel: 0 Lines: 187 Length: 2447 Insert Done parsing in 0.016 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

81
82
83     template <class T>
84     void tree<T>::remove(T num)
85     {
86         delnode(num, root);
87     }
88
89
90     template <class T>
91     void tree<T>::delnode(T num, node *&nodeptr)
92     {
93         if (num < nodeptr->value)
94         {
95             delnode(num, nodeptr->left);
96         }
97         else if (num > nodeptr->value)
98         {
99             delnode(num, nodeptr->right);
100        }
101        else
102    {

```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Line: 139 Col: 1 Sel: 0 Lines: 187 Length: 2447 Insert Done parsing in 0.016 seconds

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Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

67     break;
68 }
69 else if (num < nodeptr->value)
70 {
71     nodeptr = nodeptr->left;
72 }
73 else
74 {
75     nodeptr = nodeptr->right;
76 }
77 }
78 }
79 return status;
80 }

82
83     template <class T>
84     void tree<T>::remove(T num)
85     {
86         delnode(num, root);
87     }
88

```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Line: 139 Col: 1 Sel: 0 Lines: 187 Length: 2447 Insert Done parsing in 0.016 seconds

Type here to search

18:47 09-04-2021 ENG

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

55
56
57 template <class T>
58 int tree<T>::searchNode(T num)
59 {
60     int status = 0;
61     node *nodeptr = root;
62     while (nodeptr != NULL)
63     {
64         if (nodeptr->value == num)
65         {
66             status = 1;
67             break;
68         }
69         else if (num < nodeptr->value)
70         {
71             nodeptr = nodeptr->left;
72         }
73         else
74         {
75             nodeptr = nodeptr->right;
76         }
    
```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Line: 139 Col: 1 Sel: 0 Lines: 187 Length: 2447 Insert Done parsing in 0.016 seconds

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Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

39
40
41 template <class T>
42 void tree<T>::destroySubTree(node *nodeptr)
43 {
44     if (nodeptr->left)
45     {
46         destroySubTree(nodeptr->left);
47     }
48     if (nodeptr->right)
49     {
50         destroySubTree(nodeptr->right);
51     }
52     delete nodeptr;
53 }
54
55
56
57 template <class T>
58 int tree<T>::searchNode(T num)
59 {
60     int status = 0;
    
```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Line: 139 Col: 1 Sel: 0 Lines: 187 Length: 2447 Insert Done parsing in 0.016 seconds

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18:47 09-04-2021

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

17     insert(nodeptr->left, newNode);
18 }
19 else
20 {
21     insert(nodeptr->right, newNode);
22 }
23 }
24 }

25 template <class T>
26 void tree<T>::insertNode(T num)
27 {
28     node *newNode = NULL;
29     newNode = new node;
30     newNode->value = num;
31     newNode->left = newNode->right = NULL;
32     insert(root, newNode);
33 }
34
35 }
36
37
38 }
```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Line: 139 Col: 1 Sel: 0 Lines: 187 Length: 2447 Insert Done parsing in 0.016 seconds

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Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

1 #include "tree.h"
2 #include <iostream>
3
4 using namespace std;
5
6 template <class T>
7 void tree<T>::insert(node *&nodeptr, node *&newNode)
8 {
9     if (nodeptr == NULL)
10    {
11        nodeptr = newNode;
12    }
13    else if (newNode->value < nodeptr->value)
14    {
15        insert(nodeptr->left, newNode);
16    }
17    else
18    {
19        insert(nodeptr->right, newNode);
20    }
21 }
```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Line: 139 Col: 1 Sel: 0 Lines: 187 Length: 2447 Insert Done parsing in 0.016 seconds

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1846 09-04-2021

1846 09-04-2021

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

41 { destroySubTree(root); }

42 void insertNode(T);
43
44 int searchNode(T);
45
46 void remove(T);
47
48 void InOrder()
49 { InOrder(root); }

50 void PreOrder()
51 { PreOrder(root); }

52 void PostOrder()
53 { PostOrder(root); }

54
55
56
57
58
59
60
61 #endif

```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

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Line: 37 Col: 8 Sel: 0 Lines: 61 Length: 676 Insert Done parsing in 0.016 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

35 public:
36     tree();
37     ~tree() {
38         root = NULL;
39     }
40
41     void insertNode(T);
42
43     int searchNode(T);
44
45     void remove(T);
46
47     void InOrder()
48     { InOrder(root); }

49     void PreOrder()
50     { PreOrder(root); }

51     void PostOrder()
52     { PostOrder(root); }

53
54
55
56
57
58
59
60
61 #endif

```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Type here to search

Line: 37 Col: 8 Sel: 0 Lines: 61 Length: 676 Insert Done parsing in 0.016 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

19 node *root;
20
21 void insert(node *&, node *&);
22
23 void destroySubTree(node *);
24
25 void delnode(T, node *&);
26
27 void mkdel(node *&);
28
29 void InOrder(node *);
30
31 void PreOrder(node *);
32
33 void PostOrder(node *);
34
35 public:
36 tree()
37 { root = NULL; }
38
39 ~tree()

```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Type here to search

Line: 37 Col: 8 Sel: 0 Lines: 61 Length: 676 Insert Done parsing in 0.016 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

1 #ifndef TREE_H
2 #define TREE_H
3 #include <iostream>
4 using namespace std;
5
6 template <class T>
7 class tree
8 {
9 public:
10
11     struct node
12     {
13         T value;
14
15         node *left;
16
17         node *right;
18     };
19
20     node *root;
21
22     void insert(node *&, node *&);

```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Type here to search

Line: 37 Col: 8 Sel: 0 Lines: 61 Length: 676 Insert Done parsing in 0.016 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

48 cout<<"\n\n\n";
49
50
51 while(1)
52 {
53     cout<<"\n\n    enter node to search for,-1 to exit :   ";
54     cin>>c;
55     if(c==1) break;
56
57     if(tree_obj.searchNode(c)==1)
58     | {cout<<"\n\n    present\n";}
59     else {cout<<"\n\n    not present\n";}
60
61     cout<<"\n\n    exited \n\n ";
62
63     return 0;
64
65 }
66
67
68

```

Compiler Resources Compile Log ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Type here to search

Line: 34 Col: 41 Sel: 0 Lines: 68 Length: 1182 Insert Done parsing in 0.016 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

35     tree_obj.remove(c);
36
37 }
38 c=0;
39 cout<<"\n\n";
40 cout<<"\n\n    in-order:      ";
41 tree_obj.InOrder();
42
43 cout<<"\n\n\n    post order:      ";
44 tree_obj.PostOrder();
45
46 cout<<"\n\n\n    pre order:      ";
47 tree_obj.PreOrder();
48 cout<<"\n\n\n";
49
50
51 while(1)
52 {
53     cout<<"\n\n    enter node to search for,-1 to exit :   ";
54     cin>>c;
55     if(c==1) break;
56
57
58
59
60
61
62
63
64
65
66
67
68

```

Compiler Resources Compile Log ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Type here to search

Line: 34 Col: 41 Sel: 0 Lines: 68 Length: 1182 Insert Done parsing in 0.016 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

17 }
18 c=0;
19 cout<<"\n\n";
20 cout<<"\n\n    in-order:    ";
21 tree_obj.InOrder();
22
23 cout<<"\n\n\n    post order:    ";
24 tree_obj.PostOrder();
25
26 cout<<"\n\n\n    pre order:    ";
27 tree_obj.PreOrder();
28 cout<<"\n\n";
29 while(1){
30 cout<<"\n\n    enter node to delete,-1 to exit :    ";
31 cin>>c;
32 if (c==1) break;
33 if(tree_obj.searchNode(c)!=1)
34 {cout<<"\n\n    not present\n";continue;}
35 tree_obj.remove(c);
36
37 }
38 c=0;

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Type here to search

Line: 34 Col: 41 Sel: 0 Lines: 68 Length: 1182 Insert Done parsing in 0.016 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp tree.h tree.cpp

```

1 #include <iostream>
2
3 using namespace std;
4 #include "tree.h"
5
6
7 int main()
8 {
9     tree<int> tree_obj;int c;
10    cout<<"\n\n\n";
11    while(1){
12        cout<<"\n\n    enter node to insert,-1 to exit :    ";
13        cin>>c;
14        if (c==1) break;
15
16        tree_obj.insertNode(c);
17    }
18    c=0;
19    cout<<"\n\n";
20    cout<<"\n\n    in-order:    ";
21    tree_obj.InOrder();
22

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Type here to search

Line: 34 Col: 41 Sel: 0 Lines: 68 Length: 1182 Insert Done parsing in 0.016 seconds

Project2 - [Project2.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

Project Classes Debug main.cpp tree.h tree.cpp

```
166 cout << nodeptr->value << " ";
167 PreOrder(nodeptr->left);
168 PreOrder(nodeptr->right);
169 }
170 }
171
172 template <class T>
173 void tree<T>::PostOrder(node *nodeptr)
174 {
175 if (nodeptr)
176 {
177 PostOrder(nodeptr->left);
178 PostOrder(nodeptr->right);
179 cout << nodeptr->value << " ";
180 }
181 }
182
183
184
185 template class tree<int>;
186
```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q2\Project2.exe
- Output Size: 1.98093414306641 MiB
- Compilation Time: 2.05s

Line: 107 Col: 1 Sel: 0 Lines: 186 Length: 2445 Insert Done parsing in 0.015 seconds

Type here to search

18:47 09-04-2021

```
D:\dev\q2\Project2.exe
pre order:    5 2 3 6

enter node to search for,-1 to exit :  3

present

enter node to search for,-1 to exit :  5

present

enter node to search for,-1 to exit :  9

not present

enter node to search for,-1 to exit :  8

not present

enter node to search for,-1 to exit : -1

exited

-----
Process exited after 38.47 seconds with return value 0
Press any key to continue . . .
```

```
D:\dev\q2\Project2.exe
enter node to delete,-1 to exit :  4

enter node to delete,-1 to exit :  7

enter node to delete,-1 to exit : -1

in-order:    2 3 5 6

post order:   3 2 6 5

pre order:    5 2 3 6

enter node to search for,-1 to exit :  3

present

enter node to search for,-1 to exit :  5

present

enter node to search for,-1 to exit :  9

not present

enter node to search for,-1 to exit :  8

not present
```

```
D:\dev\q2\Project2.exe

enter node to insert,-1 to exit : 4
enter node to insert,-1 to exit : 5
enter node to insert,-1 to exit : 7
enter node to insert,-1 to exit : 6
enter node to insert,-1 to exit : 2
enter node to insert,-1 to exit : 3
enter node to insert,-1 to exit : -1

in-order: 2 3 4 5 6 7

post order: 3 2 6 7 5 4

pre order: 4 2 3 5 7 6

enter node to delete,-1 to exit : 4
enter node to delete,-1 to exit : 7
enter node to delete,-1 to exit : -1
```

```
D:\dev\q1\Project4.exe

enter element to push 2
enter element to push 6
enter element to push 7
enter element to push 4
enter element to push 3
Stack Full
num has an over loaded > operator
((num(5)>num(6))? num(5):num(6) ) = 6
using this feature, greatest element in the stack is : 7
popping elements

popped 4
popped 7
popped 6
popped 2
popped 0
Stack is Empty

Process exited after 18.15 seconds with return value 0
Press any key to continue . . .
```

```
D:\dev\q1\Project4.exe
num is a class having an integer as its private data
enter size of stack of nums 5

Pushing elements onto stack of nums

enter element to push 2
enter element to push 6
enter element to push 7
enter element to push 4
enter element to push 3

Stack Full

num has an over loaded > operator
((num(5)>num(6))? num(5):num(6) ) = 6

using this feature, greatest element in the stack is : 7

popping elements

popped 4
popped 7
popped 6
popped 2
popped 0
```

16:28 09-04-2021

3. Write a C++ program to create a sorted list with insertion, deletion, update and search operations by overloading the () operator for search operator.

Main.cpp

```
#include<iostream>
#include<cstdlib>
using namespace std;
#include "Node.h"

int main()
{
    Node* head = NULL; int a,b,c,d,e;

    Node* new_node;

    cout<<"\n\n      enter element you want to insert      ";cin>>a;
    new_node = new Node(a);
    sortedInsert(&head, new_node);

    cout<<"\n\n      enter element you want to insert      ";cin>>a;
    new_node = new Node(a);
    sortedInsert(&head, new_node);

    cout<<"\n\n      enter element you want to insert      ";cin>>a;
    new_node = new Node(a);
    sortedInsert(&head, new_node);

    cout<<"\n\n      enter element you want to insert      ";cin>>a;
    new_node = new Node(a);
```

```

sortedInsert(&head, new_node);

cout << "\n\n\n"      sorted linked List  ";
InsertSort(&head);
printList(head);

cout<<"\n\n\n"      enter element you want to delete      ";cin>>b;
if(!deleteele(&head,b)) cout<<"\n\n  elemet not found ";
cout << "\n\n\n"      sorted linked List  ";
InsertSort(&head);
printList(head);

cout<<"\n\n\n"      enter element you want to update      ";cin>>c;
cout<<"\n\n"      enter element new value in place of it  ";cin>>d;
if(!update(head,c,d)) cout<<"\n\n  elemet not found ";

cout << "\n\n\n"      sorted linked List  ";
InsertSort(&head);
printList(head);

Node obj;
obj=head;

cout<<"\n\n\n"      enter element you want to search for      ";cin>>e;
if(!search(head,e)) cout<<"\n\n  elemet not found ";
else cout<<"\n\n\n"      found at position:    "<<obj(e)<<"\n\n\n";
return 0;
}

```

Node.h

```
#ifndef NODE_H
#define NODE_H

class Node {
public:
    int data;
    Node* next;

    Node(int i=0);

    int operator()(int index);

    Node* operator=(Node* head);

    friend int deletele(Node** head_ref, int key);
    friend int update( Node* head, int searchFor,int val);
    friend void DeleteList( Node** headRef);
    friend void printList(Node* head);
    friend Node* newNode(int new_data);
    friend void InsertSort(Node** headRef);
    friend void sortedInsert(Node** head_ref,Node* new_node);
    friend int search( Node* head, int searchFor);
};

#endif
```

Node.cpp

```
#include "Node.h"
#include<iostream>
#include<cstdlib>

using namespace std;

Node::Node(int i)
{
    data=i;
}

Node* Node::operator=(Node* head)
{
    data=head->data;
    next=head->next;
    return this;
}

int search( Node* head, int searchFor)
{
    Node* current = head;
    int pos = 0;int j=0;
    while (current != NULL) {
        j++;
        if (current->data == searchFor) pos=j;
    }
}
```

```

        current = current->next;
    }
    return pos;
}

int Node::operator()(int index)
{
    return search(this,index);
}

void sortedInsert(Node** head_ref,Node* new_node)
{
    Node* current;

    if (*head_ref == NULL
        || (*head_ref)->data
        >= new_node->data) {
        new_node->next = *head_ref;
        *head_ref = new_node;
    }
    else {

        current = *head_ref;
        while (current->next != NULL && current->next->data < new_node->data)
        {
            current = current->next;
        }
        new_node->next = current->next;
    }
}

```

```
    current->next = new_node;  
}  
}
```

```
void InsertSort(Node** headRef)  
{  
    Node* result = NULL;  
    Node* current = *headRef;  
    Node* next;  
    while (current!=NULL) {  
        next = current->next;  
        sortedInsert(&result, current);  
        current = next;  
    }  
    *headRef = result;  
}
```

```
Node* newNode(int new_data)  
{
```

```
    Node* new_node = new Node();  
  
    new_node->data = new_data;  
    new_node->next = NULL;  
  
    return new_node;  
}
```

```
void printList(Node* head)
{
    Node* temp = head;
    while (temp != NULL) {
        cout << temp->data << " ";
        temp = temp->next;
    }
}
```

```
void DeleteList( Node** headRef)
{
    Node* current = *headRef;
    Node* next;
    while (current != NULL)
    {
        next = current->next;
        free(current);
        current = next;
    }
    *headRef = NULL;
}
```

```
int update( Node* head, int searchFor,int val)
{
    Node* current = head;
    int flag=0;
    while (current != NULL)
```

```
{  
    if (current->data == searchFor)  
        {current->data=val;flag=1;}  
    current = current->next;  
}  
  
return flag;  
}
```

```
int deleteele(Node** head_ref, int key)  
{  
  
    Node* temp = *head_ref;  
    Node* prev = NULL;int flag=0;  
  
    if (temp != NULL && temp->data == key)  
    {  
        *head_ref = temp->next;  
        delete temp; flag=1;  
        return flag;  
    }  
  
    else  
    {  
        while (temp != NULL && temp->data != key)  
        {  
            prev = temp;  
            temp = temp->next;  
        }  
        prev->next = temp->next;  
        delete temp; flag=1;  
        return flag;  
    }  
}
```

```
    temp = temp->next;  
}
```

```
if (temp == NULL)  
    return flag;  
else flag=1;
```

```
prev->next = temp->next;
```

```
delete temp;  
deleteele( head_ref, key);  
  
return flag;  
}  
}
```

Project5 - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

148     else
149     {
150         while (temp != NULL && temp->data != key)
151         {
152             prev = temp;
153             temp = temp->next;
154         }
155
156         if (temp == NULL)
157             return flag;
158         else flag=1;
159
160         prev->next = temp->next;
161
162         delete temp;
163         deleteele( head_ref, key);
164
165     }
166
167 }
```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Line: 5 Col: 21 Sel: 0 Lines: 174 Length: 2747 Insert Done parsing in 0.031 seconds

Type here to search

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project5 - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

133     int deleteele(Node** head_ref, int key)
134     {
135
136
137         Node* temp = *head_ref;
138         Node* prev = NULL;int flag=0;
139
140
141         if (temp != NULL && temp->data == key)
142         {
143             *head_ref = temp->next;
144             delete temp; flag=1;
145             return flag;
146         }
147
148
149         else
150         {
151             while (temp != NULL && temp->data != key)
152             {
153                 prev = temp;
154                 temp = temp->next;
155
156                 if (temp != NULL && temp->data == key)
157                     {
158                         *head_ref = temp->next;
159                         delete temp; flag=1;
160                         return flag;
161                     }
162
163             }
164
165         }
166
167     }
```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Line: 5 Col: 21 Sel: 0 Lines: 174 Length: 2747 Insert Done parsing in 0.031 seconds

Type here to search

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project5 - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

117 int update( Node* head, int searchFor,int val)
118 {
119     Node* current = head;
120     int flag=0;
121     while (current != NULL)
122     {
123         if (current->data == searchFor)
124             {current->data=val;flag=1;}
125         current = current->next;
126     }
127     return flag;
128 }
129
130
131
132
133
134 int deleteele(Node** head_ref, int key)
135 {
136
137
138     Node* temp = *head_ref;

```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Line: 5 Col: 21 Sel: 0 Lines: 174 Length: 2747 Insert Done parsing in 0.031 seconds

Type here to search

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

102 void DeleteList( Node** headRef)
103 {
104     Node* current = *headRef;
105     Node* next;
106     while (current != NULL)
107     {
108         next = current->next;
109         free(current);
110         current = next;
111     }
112     *headRef = NULL;
113 }
114
115
116
117
118 int update( Node* head, int searchFor,int val)
119 {
120     Node* current = head;
121     int flag=0;
122     while (current != NULL)
123     {

```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Line: 5 Col: 21 Sel: 0 Lines: 174 Length: 2747 Insert Done parsing in 0.031 seconds

Type here to search

19:18 09-04-2021 ENG

Project5 - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

80 Node* newNode(int new_data)
81 {
82     Node* new_node = new Node();
83
84     new_node->data = new_data;
85     new_node->next = NULL;
86
87     return new_node;
88 }
89
90 void printList(Node* head)
91 {
92     Node* temp = head;
93     while (temp != NULL) {
94         cout << temp->data << " ";
95         temp = temp->next;
96     }
97 }
98
99
100 }
```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Type here to search

Line: 5 Col: 21 Sel: 0 Lines: 174 Length: 2747 Insert Done parsing in 0.031 seconds

Projects - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

66 void InsertSort(Node** headRef)
67 {
68     Node* result = NULL;
69     Node* current = *headRef;
70     Node* next;
71     while (current!=NULL) {
72         next = current->next;
73         sortedInsert(&result, current);
74         current = next;
75     }
76     *headRef = result;
77 }
```

80 Node* newNode(int new_data)
81 {
82 Node* new_node = new Node();
83
84 new_node->data = new_data;
85 new_node->next = NULL;
86 }

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Type here to search

Line: 5 Col: 21 Sel: 0 Lines: 174 Length: 2747 Insert Done parsing in 0.031 seconds

Project5 - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

43 void sortedInsert(Node** head_ref,Node* new_node)
44 {
45     Node* current;
46
47     if (*head_ref == NULL
48         || (*head_ref)->data
49             >= new_node->data) {
50         new_node->next = *head_ref;
51         *head_ref = new_node;
52     }
53     else {
54
55         current = *head_ref;
56         while (current->next != NULL && current->next->data < new_node->data)
57         {
58             current = current->next;
59         }
60         new_node->next = current->next;
61         current->next = new_node;
62     }
63 }
```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.9724931066895 MiB
- Compilation Time: 1.88s

Line: 5 Col: 21 Sel: 0 Lines: 174 Length: 2747 Insert Done parsing in 0.031 seconds

Type here to search

Projects - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

21
22
23 int search( Node* head, int searchFor)
24 {
25     Node* current = head;
26     int pos = 0;int j=0;
27     while (current != NULL) {
28         j++;
29         if (current->data == searchFor) pos=j;
30         current = current->next;
31     }
32     return pos;
33 }
```

int Node::operator()(int index)

```

37
38 {
39     return search(this,index);
40 }
41 }
```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.9724931066895 MiB
- Compilation Time: 1.88s

Line: 5 Col: 21 Sel: 0 Lines: 174 Length: 2747 Insert Done parsing in 0.031 seconds

Type here to search

19:18 09-04-2021 ENG

Project5 - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

1 #include "Node.h"
2 #include<iostream>
3 #include<cstdlib>
4
5 using namespace std;
6
7
8 Node::Node(int i)
9 {
10     data=i;
11 }
12
13
14 Node* Node::operator=(Node* head)
15 {
16     data=head->data;
17     next=head->next;
18     return this;
19 }
20
21
22

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Type here to search

Line: 5 Col: 21 Sel: 0 Lines: 174 Length: 2747 Insert Done parsing in 0.031 seconds

Projects - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIK-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

7 public:
8     int data;
9     Node* next;
10
11     Node(int i=0);
12
13     int operator()(int index);
14
15     Node* operator=(Node* head);
16
17     friend int deletee(Node** head_ref, int key);
18     friend int update( Node* head, int searchFor,int val);
19     friend void DeleteList( Node* headRef);
20     friend void printList(Node* head);
21     friend Node* newNode(int new_data);
22     friend void InsertSort(Node** headRef);
23     friend void sortedInsert(Node** head_ref,Node* new_node);
24     friend int search( Node* head, int searchFor);
25 };
26 #endif
27

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Type here to search

Line: 3 Col: 1 Sel: 0 Lines: 27 Length: 580 Insert Done parsing in 0.031 seconds

Project5 - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

1 #ifndef NODE_H
2 #define NODE_H
3 |
4
5 class Node {
6 public:
7     int data;
8     Node* next;
9
10    Node(int i=0);
11
12    int operator()(int index);
13
14    Node* operator=(Node* head);
15
16    friend int deletee(Node** head_ref, int key);
17    friend int update( Node* head, int searchFor,int val);
18    friend void DeleteList( Node* headRef);
19    friend void printList(Node* head);
20    friend Node* newNode(int new_data);
21    friend void InsertSort(Node** headRef);
22

```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Type here to search

Line: 3 Col: 1 Sel: 0 Lines: 27 Length: 580 Insert Done parsing in 0.031 seconds

Projects - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

41 | InsertSort(&head);
42 | printList(head);
43
44 cout<<"\n\n\n      enter element you want to update   ";cin>>c;
45 cout<<"\n\n      enter element new value in place of it  ";cin>>d;
46 if(!update(head,c,d)) cout<<"\n\n      elemet not found ";
47
48 cout << "\n\n\n      sorted linked List      ";
49 InsertSort(&head);
50 printList(head);
51
52 Node obj;
53 obj.head;
54 cout<<"\n\n\n      enter element you want to search for   ";cin>>e;
55 if(!search(head,e)) cout<<"\n\n      elemet not found ";
56 else cout<<"\n\n\n      found at position:      "<<obj(e)<<"\n\n\n";
57
58
59 return 0;
60 }
61

```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Type here to search

Line: 5 Col: 1 Sel: 0 Lines: 61 Length: 1660 Insert Done parsing in 0.031 seconds

Project5 - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

35     printList(head);
36
37     cout<<"\n\n\n      enter element you want to delete    ";cin>>b;
38     if(deleteele(&head,b)) cout<<"\n\n      elemet not found ";
39     cout << "\n\n\n      sorted linked List    ";
40     InsertSort(&head);
41     printList(head);
42
43     cout<<"\n\n\n      enter element you want to update   ";cin>>c;
44     cout<<"\n\n\n      enter element new value in place of it  ";cin>>d;
45     if(!update(head,c,d)) cout<<"\n\n      elemet not found ";
46
47     cout << "\n\n\n      sorted linked List    ";
48     InsertSort(&head);
49     printList(head);
50
51     Node obj;
52     obj.head;
53
54     cout<<"\n\n\n      enter element you want to search for   ";cin>>e;
55     if(!search(head,e)) cout<<"\n\n      elemet not found ";
56     else cout<<"\n\n\n      found at position:    "<<obj(e)<<"\n\n\n";

```

Compiler Resources CompileLog ✓ Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Line: 5 Col: 1 Sel: 0 Lines: 61 Length: 1660 Insert Done parsing in 0.031 seconds

Type here to search

Projects - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp Node.h Node.cpp

```

16     new_node = new Node(a);
17     sortedInsert(&head, new_node);
18
19     cout<<"\n\n      enter element you want to insert   ";cin>>a;
20     new_node = new Node(a);
21     sortedInsert(&head, new_node);
22
23     cout<<"\n\n      enter element you want to insert   ";cin>>a;
24     new_node = new Node(a);
25     sortedInsert(&head, new_node);
26
27     cout<<"\n\n      enter element you want to insert   ";cin>>a;
28     new_node = new Node(a);
29     sortedInsert(&head, new_node);
30
31
32     cout << "\n\n\n      sorted linked List    ";
33     InsertSort(&head);
34     printList(head);
35
36
37

```

Compiler Resources CompileLog ✓ Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Line: 5 Col: 1 Sel: 0 Lines: 61 Length: 1660 Insert Done parsing in 0.031 seconds

Type here to search

19:18 09-04-2021 ENG

Project5 - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug

(globals)

```

main.cpp Node.h Node.cpp
1 #include<iostream>
2 #include<cstdlib>
3
4 using namespace std;
5
6 #include "Node.h"
7
8
9 int main()
10 {
11     Node* head = NULL; int a,b,c,d,e;
12     Node* new_node;
13
14     cout<<"\n\n    enter element you want to insert    ";cin>>a;
15     new_node = new Node(a);
16     sortedInsert(&head, new_node);
17
18     cout<<"\n\n    enter element you want to insert    ";cin>>a;
19     new_node = new Node(a);
20     sortedInsert(&head, new_node);
21
22 }
```

Compiler Resources CompileLog ✓ Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Line: 5 Col: 1 Sel: 0 Lines: 61 Length: 1660 Insert Done parsing in 0.031 seconds

Type here to search

Projects - [Project5.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug

(globals)

```

main.cpp Node.h Node.cpp
154     temp = temp->next;
155 }
156
157 if (temp == NULL)
158     return flag;
159 else flag=1;
160
161
162 prev->next = temp->next;
163
164
165 delete temp;
166 deleteele( head_ref, key);
167
168
169 return flag;
170
171 }
```

Compiler Resources CompileLog ✓ Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q3\Project5.exe
- Output Size: 1.97249031066895 MiB
- Compilation Time: 1.88s

Line: 5 Col: 21 Sel: 0 Lines: 174 Length: 2747 Insert Done parsing in 0.031 seconds

Type here to search

```
D:\dev\q3\Project5.exe

sorted linked List  3 5 7 9

enter element you want to delete      3

sorted linked List  5 7 9

enter element you want to update      5

enter element new value in place of it  8

sorted linked List  7 8 9

enter element you want to search for   7

found at position:      1

-----
Process exited after 22.06 seconds with return value 0
Press any key to continue . . .
```

```
D:\dev\q3\Project5.exe

enter element you want to insert      7

enter element you want to insert      5

enter element you want to insert      3

enter element you want to insert      9

sorted linked List  3 5 7 9

enter element you want to delete      3

sorted linked List  5 7 9

enter element you want to update      5

enter element new value in place of it  8

sorted linked List  7 8 9

enter element you want to search for   7

found at position:      1
```

```
D:\dev\q3\Project5.exe
sorted linked List    3 4 5 6

enter element you want to delete      4

sorted linked List    3 5 6

enter element you want to update      5
enter element new value in place of it 7

sorted linked List    3 6 7

enter element you want to search for   6

found at position:      2

Process exited after 32.74 seconds with return value 0
Press any key to continue . . .
```

```
D:\dev\q3\Project5.exe
enter element you want to insert      5
enter element you want to insert      6
enter element you want to insert      3
enter element you want to insert      4

sorted linked List    3 4 5 6

enter element you want to delete      4

sorted linked List    3 5 6

enter element you want to update      5
enter element new value in place of it 7

sorted linked List    3 6 7

enter element you want to search for   6

found at position:      2
```

4. Write a C++ program to create a Car class consisting of Wheels, Engine, Gearbox as components. Each of the component specified above is a class having its own properties. Display the Car object with all its components using Object Composition.

Main.cpp

```
#include <iostream>
using namespace std;
#include "classes.h"

int main()
{
    cout<<"\n\n\n    class members of car: Wheels* wheels, Engine engine, GearBox* gbox ";
    double gr;int m,sn;

    cout<<" \n\n\n    enter wheels spoke numbers : ";cin>>sn;
    cout<<" \n\n\n    enter gearbox ratio : ";cin>>gr;
    cout<<" \n\n\n    enter engine model : ";cin>>m;

    Wheels* wheels = new Wheels(sn);
    GearBox* gbox= new GearBox(gr);

    Car car(wheels, gbox);
    car.engine.set_model(m);

    cout<<"\n\n\n\n    car.wheels->get_spoke_num()    "
    <<car.wheels->get_spoke_num()<<"\n\n\n\n    car.engine.get_model()      "
    <<car.engine.get_model()<<"\n\n\n\n    car.gbox->get_gear_ratio()      "
    <<car.gbox->get_gear_ratio()<<"\n\n\n\n";

    return 0;
}
```

Classes.h

```
class Engine
{
    int model;
public:
    Engine(int m=0);
    int get_model();
    void set_model(int m=0);
};
```

```
class Wheels
```

```
{
    int spoke_num;
public:
    Wheels(int sn=0);
    int get_spoke_num();
};
```

```
class GearBox
```

```
{
    double gear_ratio;
```


Classes.cpp

```
#include <iostream>
using namespace std;
#include"classes.h"

Engine::Engine(int m){
    set_model(m);
}

int Engine::get_model()
{
    return model;
}

void Engine::set_model(int m)
{
    model=m;
}

Wheels::Wheels(int sn)
{spoke_num=sn; }

int Wheels::get_spoke_num()
{
    return spoke_num;
}
```

```
GearBox::GearBox(double gr){
```

```
    gear_ratio=gr;
```

```
}
```

```
double GearBox::get_gear_ratio()
```

```
{
```

```
    return gear_ratio;
```

```
}
```

```
Car::Car(Wheels* w, GearBox* gb)
```

```
{
```

```
    wheels = w;
```

```
    gbox= gb;
```

```
}
```

Project7 - [Project7.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp classes.h classes.cpp

```

11 |     double gr;int m,sn;
12 |     cout<<" \n\n\n    enter wheels spoke numbers : ";cin>>sn;
13 |     cout<<" \n\n\n    enter gearbox ratio : ";cin>>gr;
14 |     cout<<" \n\n\n    enter engine model   : ";cin>>m;
15 |
16 |     Wheels* wheels = new Wheels(sn);
17 |     GearBox* gbox= new GearBox(gr);
18 |
19 |     Car car(wheels, gbox);
20 |
21 |     car.engine.set_model(m);
22 |
23 |
24 |
25 |     cout<<"\n\n\n        car.wheels->get_spoke_num()      "
26 |     <<car.wheels->get_spoke_num()<<"\n\n\n        car.engine.get_model()          "
27 |     <<car.engine.get_model()<<"\n\n\n        car.gbox->get_gear_ratio()       "
28 |     <<car.gbox->get_gear_ratio()<<"\n\n\n";
29 |
30 |
31 |     return 0;
}

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q4\Project7.exe
- Output Size: 1.9696067749023 MiB
- Compilation Time: 2.44s

Type here to search

Line: 4 Col: 1 Sel: 0 Lines: 31 Length: 812 Insert Done parsing in 0.032 seconds

Project7 - [Project7.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp classes.h classes.cpp

```

1 #include <iostream>
2 using namespace std;
3 #include"classes.h"
4
5 int main()
6 {
7
8     cout<<"\n\n\n    class members of car: Wheels* wheels, Engine engine, GearBox* gbox ";
9
10
11     double gr;int m,sn;
12     cout<<" \n\n\n    enter wheels spoke numbers : ";cin>>sn;
13     cout<<" \n\n\n    enter gearbox ratio : ";cin>>gr;
14     cout<<" \n\n\n    enter engine model   : ";cin>>m;
15
16     Wheels* wheels = new Wheels(sn);
17     GearBox* gbox= new GearBox(gr);
18
19     Car car(wheels, gbox);
20
21     car.engine.set_model(m);
22

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q4\Project7.exe
- Output Size: 1.9696067749023 MiB
- Compilation Time: 2.44s

Type here to search

Line: 4 Col: 1 Sel: 0 Lines: 31 Length: 812 Insert Done parsing in 0.032 seconds

Project7 - [Project7.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp classes.h classes.cpp

```

28 L }
29
30 |
31 GearBox::GearBox(double gr){
32     gear_ratio=gr;
33 }
34
35 double GearBox::get_gear_ratio()
36 {
37     return gear_ratio;
38 }
39
40
41
42
43 Car::Car(Wheels* w, GearBox* gb)
44 {
45     wheels = w;
46     gbox= gb;
47 }
48

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q4\Project7.exe
- Output Size: 1.9696067749023 MiB
- Compilation Time: 2.44s

Line: 30 Col: 1 Sel: 0 Lines: 48 Length: 574 Insert Done parsing in 0.032 seconds

Type here to search

Project7 - [Project7.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp classes.h classes.cpp

```

20
21
22 Wheels::Wheels(int sn)
23 {spoke_num=sn; }
24
25 int Wheels::get_spoke_num()
26 {
27     return spoke_num;
28 }
29
30
31 GearBox::GearBox(double gr){
32     gear_ratio=gr;
33 }
34
35 double GearBox::get_gear_ratio()
36 {
37     return gear_ratio;
38 }
39
40
41

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q4\Project7.exe
- Output Size: 1.9696067749023 MiB
- Compilation Time: 2.44s

Line: 2 Col: 20 Sel: 0 Lines: 48 Length: 574 Insert Done parsing in 0.032 seconds

Type here to search

Project7 - [Project7.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp classes.h classes.cpp

```

1 #include <iostream>
2 using namespace std;
3 #include "classes.h"
4 Engine::Engine(int m){
5     set_model(m);
6 }
7
8
9 int Engine::get_model()
10 {
11     return model;
12 }
13
14 void Engine::set_model(int m)
15 {
16     model=m;
17 }
18
19
20
21
22 Wheels::Wheels(int sn)

```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q4\Project7.exe
- Output Size: 1.9696067749023 MiB
- Compilation Time: 2.44s

Line: 2 Col: 20 Sel: 0 Lines: 48 Length: 574 Insert Done parsing in 0.032 seconds

23:14 09-04-2021

Project7 - [Project7.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp classes.h classes.cpp

```

26 class GearBox
27 {
28     double gear_ratio;
29 public:
30     GearBox(double gr=0);
31
32     double get_gear_ratio();
33 };
34
35
36
37
38 class Car
39 {
40 public:
41     Wheels* wheels;
42     Engine engine;
43     GearBox* gbox;
44
45     Car(Wheels* w, GearBox* gb);
46 };
47

```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q4\Project7.exe
- Output Size: 1.9696067749023 MiB
- Compilation Time: 2.44s

Line: 2 Col: 13 Sel: 0 Lines: 47 Length: 461 Insert Done parsing in 0.032 seconds

23:14 09-04-2021

Project7 - [Project7.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp classes.h classes.cpp

```

12
13 class Wheels
14 {
15
16     int spoke_num;
17 public:
18
19     Wheels(int sn=0);
20
21     int get_spoke_num();
22 };
23
24
25
26
27 class GearBox
28 {
29     double gear_ratio;
30 public:
31     GearBox(double gr=0);
32
33     double get gear ratio();

```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q4\Project7.exe
- Output Size: 1.9696067749023 MiB
- Compilation Time: 2.44s

Type here to search

Line: 2 Col: 13 Sel: 0 Lines: 47 Length: 461 Insert Done parsing in 0.032 seconds

Project7 - [Project7.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp classes.h classes.cpp

```

1
2 class Engine
3 {
4     int model;
5 public:
6     Engine(int m=0);
7     int get_model();
8
9     void set _model(int m=0);
10 };
11
12
13 class Wheels
14 {
15
16     int spoke_num;
17 public:
18
19     Wheels(int sn=0);
20
21     int get spoke num();
22

```

Compiler Resources CompileLog Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q4\Project7.exe
- Output Size: 1.9696067749023 MiB
- Compilation Time: 2.44s

Type here to search

Line: 2 Col: 13 Sel: 0 Lines: 47 Length: 461 Insert Done parsing in 0.032 seconds

```
D:\dev\q4\Project7.exe

class members of car: Wheels* wheels, Engine engine, GearBox* gbox

enter wheels spoke numbers : 4

enter gearbox ratio : 5.7

enter engine model : 7789

car.wheels->get_spoke_num() 4

car.engine.get_model() 7789

car.gbox->get_gear_ratio() 5.7

-----

Process exited after 16.26 seconds with return value 0
Press any key to continue . . .
```

23:05 09-04-2021

5. Write a program to input an array of strings. Then reverse the string in the following format:

a. INPUT: Happy Birthday To You

Output: You To Birthday Happy

q5.cpp

```
#include <iostream>
#include <cstring>
using namespace std;

int main()
{
    char str[100], revstr[100];
    int len, i, j, start, end;

    cout<<"\n\n\n      Enter any string:      ";
    gets(str);

    len = strlen(str);
    j = 0;

    start = len - 1;
    end = len - 1;

    while(start > 0)
    {
        if(str[start] == ' ')
        {
```

```

    i = start + 1;
    while(i <= end)
    {
        revstr[j] = str[i];

        i++;
        j++;
    }
    revstr[j++] = ' ';

    end = start - 1;
}

start--;
}

for(i=0; i<=end; i++)
{
    revstr[j] = str[i];
    j++;
}
revstr[j] = '\0';

cout<<"\n\n\n\n    Reverse ordered words    "<<revstr;
cout<<"\n\n\n\n";
return 0;
}

```

D:\dev\q5.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIFF-GCC 4.9.2 64-bit Release

Project Classes Debug q5.cpp

```
19 end = len - 1;
20
21 while(start > 0)
22 {
23
24     if(str[start] == ' ')
25     {
26         i = start + 1;
27         while(i <= end)
28         {
29             revstr[j] = str[i];
30
31             i++;
32             j++;
33         }
34         revstr[j++] = ' ';
35
36         end = start - 1;
37     }
38
39     start--;
40 }
```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q5.exe
- Output Size: 1.90076732635498 MiB
- Compilation Time: 1.55s

Line: 4 Col: 21 Sel: 0 Lines: 57 Length: 897 Insert Done parsing in 0.016 seconds 19:28 09-04-2021

Type here to search

D:\dev\q5.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIFF-GCC 4.9.2 64-bit Release

Project Classes Debug q5.cpp

```
1
2 #include <iostream>
3 #include <cstring>
4 using namespace std;
5
6 int main()
7 {
8     char str[100], revstr[100];
9     int len, i, j, start, end;
10
11    cout<<"\n\n\n"      Enter any string:      " ;
12    gets(str);
13
14    len = strlen(str);
15    j = 0;
16
17
18    start = len - 1;
19    end = len - 1;
20
21    while(start > 0)
22    {
```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q5.exe
- Output Size: 1.90076732635498 MiB
- Compilation Time: 1.55s

Line: 4 Col: 21 Sel: 0 Lines: 57 Length: 897 Insert Done parsing in 0.016 seconds 19:28 09-04-2021

Type here to search

D:\dev\q5.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug q5.cpp

```
37     }
38
39     start--;
40
41
42     for(i=0; i<=end; i++)
43     {
44         revstr[j] = str[i];
45         j++;
46     }
47
48
49     revstr[j] = '\0';
50
51
52     cout<<"\n\n\n"      Reverse ordered words      "<<revstr;
53     cout<<"\n\n\n";
54
55
56     return 0;
57 }
```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q5.exe
- Output Size: 1.90076732635498 MiB
- Compilation Time: 1.55s

Line: 4 Col: 21 Sel: 0 Lines: 57 Length: 897 Insert Done parsing in 0.016 seconds

Type here to search

19:28 09-04-2021 ENG

D:\dev\q5.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIFF-GCC 4.9.2 64-bit Release

Project Classes Debug q5.cpp

```
19 end = len - 1;
20
21 while(start > 0)
22 {
23
24     if(str[start] == ' ')
25     {
26         i = start + 1;
27         while(i <= end)
28         {
29             revstr[j] = str[i];
30
31             i++;
32             j++;
33         }
34         revstr[j++] = ' ';
35
36         end = start - 1;
37     }
38
39     start--;
40 }
```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q5.exe
- Output Size: 1.90076732635498 MiB
- Compilation Time: 1.55s

Line: 4 Col: 21 Sel: 0 Lines: 57 Length: 897 Insert Done parsing in 0.016 seconds 19:28 09-04-2021

Type here to search

D:\dev\q5.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIFF-GCC 4.9.2 64-bit Release

Project Classes Debug q5.cpp

```
1
2 #include <iostream>
3 #include <cstring>
4 using namespace std;
5
6 int main()
7 {
8     char str[100], revstr[100];
9     int len, i, j, start, end;
10
11    cout<<"\n\n\n"      Enter any string:      " ;
12    gets(str);
13
14    len = strlen(str);
15    j = 0;
16
17
18    start = len - 1;
19    end = len - 1;
20
21    while(start > 0)
22    {
```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q5.exe
- Output Size: 1.90076732635498 MiB
- Compilation Time: 1.55s

Line: 4 Col: 21 Sel: 0 Lines: 57 Length: 897 Insert Done parsing in 0.016 seconds 19:28 09-04-2021

Type here to search

D:\dev\q5.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug q5.cpp

```
37     }
38
39     start--;
40
41
42
43     for(i=0; i<=end; i++)
44     {
45         revstr[j] = str[i];
46         j++;
47     }
48
49
50     cout<<"\n\n\n"      Reverse ordered words      "<<revstr;
51
52
53     cout<<"\n\n\n";
54
55
56     return 0;
57 }
```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q5.exe
- Output Size: 1.90076732635498 MiB
- Compilation Time: 1.55s

Line: 4 Col: 21 Sel: 0 Lines: 57 Length: 897 Insert Done parsing in 0.016 seconds

Type here to search

19:28 09-04-2021

```
D:\dev\q5.exe

Enter any string: This is the month of April

Reverse ordered words April of month the is This

-----
Process exited after 31.26 seconds with return value 0
Press any key to continue . . .
```

```
D:\dev\q5.exe

Enter any string: Happy Birthday To You

Reverse ordered words You To Birthday Happy

-----
Process exited after 17.12 seconds with return value 0
Press any key to continue . . .
```

6. Write a C ++ program to accept a string consisting of ten words atleast. Then convert the initial letter of each word into Capital(InitCaps)

Q6.cpp

```
#include <iostream>
using namespace std;
int main()
{
    char sentence[500];

    cout << "\n\n\n\n      enter sentence      ";
    cin.getline(sentence,500);

    sentence[0] = toupper(sentence[0]);

    for (int i = 1; i < 500; i++)
    {
        if ( sentence[i - 1] == ' ' )
            sentence[i] = toupper( sentence[i] );
        else
            sentence[i] = tolower(sentence[i]);
    }

    cout <<"\n\n\n\n      after capitalizing first letter of each word :      " << sentence << "\n\n\n\n";
}

return 0;
```

Project10 - [Project10.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIFF-GCC 4.9.2 64-bit Release

Project Classes Debug

(globals)

```

q6.cpp
1 #include <iostream>
2 using namespace std;
3 int main()
4 {
5
6
7     char sentence[500];
8
9     cout << "\n\n\n\n      enter sentence      ";
10    cin.getline(sentence,500);
11
12    sentence[0] = toupper(sentence[0]);
13
14    for (int i = 1; i < 500; i++)
15    {
16        if ( sentence[i - 1] == ' ' )
17            sentence[i] = toupper( sentence[i] );
18        else
19            sentence[i] = tolower(sentence[i]);
20    }
21
22    cout <<"\n\n\n\n\n      after capitalizing first letter of each word :      " << sentence << "\n\n\n\n";

```

Compiler Resources Compile Log ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q6.exe
- Output Size: 1.90044975280762 MiB
- Compilation Time: 1.70s

Line: 22 Col: 108 Sel: 0 Lines: 25 Length: 564 Insert Done parsing in 0.015 seconds

Type here to search

Project10 - [Project10.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIFF-GCC 4.9.2 64-bit Release

Project Classes Debug

(globals)

```

q6.cpp
5
6
7     char sentence[500];
8
9     cout << "\n\n\n\n      enter sentence      ";
10    cin.getline(sentence,500);
11
12    sentence[0] = toupper(sentence[0]);
13
14    for (int i = 1; i < 500; i++)
15    {
16        if ( sentence[i - 1] == ' ' )
17            sentence[i] = toupper( sentence[i] );
18        else
19            sentence[i] = tolower(sentence[i]);
20    }
21
22    cout <<"\n\n\n\n\n      after capitalizing first letter of each word :      " << sentence << "\n\n\n\n";
23
24    return 0;
25

```

Compiler Resources Compile Log ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q6.exe
- Output Size: 1.90044975280762 MiB
- Compilation Time: 1.70s

Line: 22 Col: 108 Sel: 0 Lines: 25 Length: 564 Insert Done parsing in 0.015 seconds

Type here to search

2016 09-04-2021

```
D:\dev\q6.exe

enter sentence      Their constellation, known as yahdii, spans more than 133 degrees across the sky,

after capitalizing first letter of each word :      Their Constellation, Known As Yahdii, Spans More Than 133 Degrees Across The Sky,

-----
Process exited after 3.844 seconds with return value 0
Press any key to continue . . .
```

```
D:\dev\q6.exe

enter sentence      The constellation Orion is visible throughout the world and is one of the most obvious examples

after capitalizing first letter of each word :      The Constellation Orion Is Visible Throughout The World And Is One Of The Most Obvious Examples

-----
Process exited after 7.426 seconds with return value 0
Press any key to continue . . .
```

20:14 09-04-2021

20:15 09-04-2021

7. Write a C++ program to simulate the Find and Replace option of Word document in a given text (Input should be a minimum of 4-5 lines).

“Main.cpp”

```
#include<iostream>
#include<cstring>
using namespace std;
void replace(char [],char[],char[]);
main()
{
    char text[500],old[30],word[30];
    cout<<"\n\n\n\n      Enter text : \n\n\n\n";
    cin.getline (text, 500, '\n');
    cout<<"\n\n\n\n\n\n\n\n      Enter word to replace : ";
    cin.getline (old, 30, '\n');
    cout<<"\n\n\n\n      Enter new word : ";
    cin.getline (word,30, '\n');
    replace(text,old,word);
    cout<<"\n\n\n\n      The text after replacing : \n\n\n\n      " <<text<<"\n\n\n\n";
}

void replace(char text[],char old[],char word[])
{
    int textLen,oldLen,newLen;
    int i=0,j,k;
    int flag=0,start,end;
    textLen=strlen(text);
    oldLen=strlen(old);}
```

```
newLen=strlen(word);

for(i=0;i<textLen;i++)
{
    flag=0;
    start=i;
    for(j=0;text[i]==old[j];j++,i++)
        if(j==oldLen-1)
            flag=1;
    end=i;
    if(flag==0)
        i-=j;
    else
    {
        for(j=start;j<end;j++)
        {
            for(k=start;k<textLen;k++)
                text[k]=text[k+1];
            textLen--;
            i--;
        }
        for(j=start;j<start+newLen;j++)
        {
            for(k=textLen;k>=j;k--)
                text[k+1]=text[k];
            text[j]=word[j-start];
            textLen++;
            i++;
        }
    }
}
```

Project10 - [Project10.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

main.cpp

```

28 newLen=strlen(word);
29
30 for(i=0;i<textLen;i++)
31 {
32     flag=0;
33     start=i;
34     for(j=0;text[i]==old[j];j++,i++)
35     if(j==oldLen-1)
36         flag=1;
37     end=i;
38     if(flag==0)
39         i=j;
40     else
41     {
42         for(j=start;j<end;j++)
43         {
44             for(k=start;k<textlen;k++)
45                 text[k]=text[k+1];
46             textlen--;
47             i--;
48         }
49

```

Compiler Resources CompileLog Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q7\trial\Project10.exe
- Output Size: 1.90161228179932 MiB
- Compilation Time: 0.27s

Type here to search

Project10 - [Project10.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

main.cpp

```

17 replace(text,old,word);
18 cout<<"\n\n\n\n"      "The text after replacing : \n\n\n\n"      " <<text<<"\n\n\n\n\n";
19 }
20
21 void replace(char text[],char old[],char word[])
22 {
23     int textlen,oldLen,newLen;
24     int i=0,j,k;
25     int flag=0,start,end;
26     textlen=strlen(text);
27     oldLen=strlen(old);
28     newLen=strlen(word);
29
30     for(i=0;i<textLen;i++)
31     {
32         flag=0;
33         start=i;
34         for(j=0;text[i]==old[j];j++,i++)
35         if(j==oldLen-1)
36             flag=1;
37         end=i;
38         if(flag==0)
39

```

Compiler Resources CompileLog Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q7\trial\Project10.exe
- Output Size: 1.90161228179932 MiB
- Compilation Time: 0.27s

Type here to search

Project10 - [Project10.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIFF-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp

```

1 #include<iostream>
2 #include<cstring>
3 using namespace std;
4
5 void replace(char [],char[],char[]);
6
7 main()
8 {
9     char text[500],old[30],word[30];
10    cout<<"\n\n\n\n      Enter text : \n\n\n\n      ";
11    cin.getline (text, 500, '\n');
12    cout<<"\n\n\n\n      Enter word to replace :      ";
13    cin.getline (old, 30, '\n');
14    cout<<"\n\n\n\n      Enter new word :      ";
15    cin.getline (word,30, '\n');
16    replace(text,old,word);
17    cout<<"\n\n\n\n      The text after replacing : \n\n\n\n      " <<text<<"\n\n\n\n";
18 }
19
20
21 void replace(char text[],char old[],char word[])
22 {

```

Compiler Resources CompileLog ✓ Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q7\trial\Project10.exe
- Output Size: 1.90161228179932 MiB
- Compilation Time: 0.27s

Line: 6 Col: 37 Sel: 0 Lines: 61 Length: 1113 Insert Done parsing in 0.031 seconds

Type here to search

Project10 - [Project10.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIFF-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp

```

41 {
42     for(j=start;j<end;j++)
43     {
44         for(k=start;k<textLen;k++)
45             text[k]=text[k+1];
46             textlen--;
47         i--;
48     }
49
50     for(j=start;j<start+newLen;j++)
51     {
52         for(k=textLen;k>=j;k--)
53             text[k+1]=text[k];
54             text[j]=word[j-start];
55             textlen++;
56         i++;
57     }
58 }
59
60
61

```

Compiler Resources CompileLog ✓ Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q7\trial\Project10.exe
- Output Size: 1.90161228179932 MiB
- Compilation Time: 0.27s

Line: 6 Col: 37 Sel: 0 Lines: 61 Length: 1113 Insert Done parsing in 0.031 seconds

Type here to search

```
D:\dev\q7\trial\Project10.exe

Enter text : 

Scientists and anthropologists have long wondered why we see similarities and differences in the night sky. Is it cultural? Is it about location? Is it something more inherent? Is it a mix of factors? These are questions that have yet to be answered, but the new study suggests there's something universal in stargazing, something capable of transcending both space, time, and people.

Enter word to replace : and

Enter new word : or maybe

The text after replacing :

Scientists or maybe anthropologists have long wondered why we see similarities or maybe differences in the night sky. Is it cultural? Is it about location? Is it something more inherent? Is it a mix of factors? These are questions that have yet to be answered, but the new study suggests there's something universal in stargazing, something capable of transcending both space, time, or maybe people.

Process exited after 28.03 seconds with return value 0
Press any key to continue . . .
```

```
Type here to search 2008 09-04-2021
D:\dev\q7\trial\Project10.exe

Enter text : 

Good morning my name is swaminathan navinashok

Enter word to replace : morning

Enter new word : evening

The text after replacing :

Good evening my name is swaminathan navinashok

Process exited after 45.46 seconds with return value 0
Press any key to continue . . .
```

```
Type here to search 2007 09-04-2021
D:\dev\q7\trial\Project10.exe
```

**8.Create a Queue with proper Enqueue and Dequeue operations as member functions.
Overload the [] operator to find out the duplicate element present in the queue.**

Main.cpp

```
#include <iostream>
#include <cstdlib>
using namespace std;
#include "queue.h"

int main()
{
    cout<<"\n\n\n\n"   enter size for queue of strings      " ;int size=0;
    cin>>size;string s;
    queue<string> q(size);

    for(int i=0;i<size;i++){
        cout<<"\n\n"   enter element to enqueue      ";cin>>s;q.enqueue(s);
    }

    if (q.underflow()) {
        cout << "\n\n\n"  The queue is underflow, exiting \n";return 0;
    }
    else {
        cout << "\n\n\n\n"  The queue is not underflow, proceeding .... \n\n";
    }

    cout<<"\n\n\n"  checking for duplicates : \n\n\n";
```

```
for(int i=0;i<size;i++)
{
    for(int j=i;j<size;j++)
    {
        if(q[i]==q[j] && i!=j)
            {cout<<"\n\n    "<<q[i]<<" is duplicated \n\n";}
    }
}

cout<<" \n\n\n      dequeuing elements \n\n\n";

for(int i=0;i<size;i++){
    q.dequeue();
}

return 0;
}
```

Queue.h

```
#ifndef QUEUE_H
```

```
#define QUEUE_H
```

```
template <class T>
```

```
class queue
```

```
{
```

```
    T *arr;
```

```
    int cur_size;
```

```
    int max_size;
```

```
    int front;
```

```
    int rear;
```

```
public:
```

```
    queue(int size = 0);
```

```
    void dequeue();
```

```
    void enqueue(T)
```

```
    int size();
```

```
    int underflow();
```

```
    int overflow();
```

```
    T operator[](int);
```

```
};
```

```
#endif
```

Queue.cpp

```
#include "queue.h"
#include <iostream>
#include <cstdlib>
using namespace std;

template <class T>
T queue<T>::operator[](int i)
{
    return arr[i];
}

template <class T>
queue<T>::queue(int sz)
{
    arr = new T[sz];
    max_size = sz;
    front = 0;
    rear = -1;
    cur_size = 0;
}

template <class T>
void queue<T>::dequeue()
{
    if (!underflow())
    {
```

```
cout << "\n\n      dequeuing   " << arr[front] << "\n\n";  
  
front = (front + 1) % max_size;  
cur_size--;  
}  
}
```

```
template <class T>  
void queue<T>::enqueue(T item)  
{  
  
if (!overflow())  
{  
  
cout << "\n\n\n      enqueueing   " << item << "\n\n";  
  
rear = (rear + 1) % max_size;  
arr[rear] = item;  
cur_size++;  
}  
}
```

```
template <class T>
```

```
int queue<T>::size() {
```

```
    return cur_size;
```

```
}
```

```
template <class T>
```

```
int queue<T>::underflow() {
```

```
    return (size() == 0);
```

```
}
```

```
template <class T>
```

```
int queue<T>::overflow() {
```

```
    return (size() == max_size);
```

```
}
```

```
template class queue<string>;
```

Project3 - [Project3.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp queue.h queue.cpp

```

40
41
42 template <class T>
43 void queue<T>::enqueue(T item)
44 {
45
46     if (!overflow())
47     {
48
49         cout << "\n\n\n      enqueueing      " << item << "\n\n";
50
51         rear = (rear + 1) % max_size;
52         arr[rear] = item;
53         cur_size++;
54     }
55 }
56
57
58
59
60 template <class T>
61 int queue<T>::size() {

```

Compiler Resources CompileLog Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q8\Project3.exe
- Output Size: 2.00583076477051 MiB
- Compilation Time: 2.72s

Line: 69 Col: 2 Sel: 0 Lines: 79 Length: 1090 Insert Done parsing in 0.032 seconds

Type here to search

Project3 - [Project3.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp queue.h queue.cpp

```

23
24 template <class T>
25 void queue<T>::dequeue()
26 {
27
28     if (!underflow())
29     {
30
31         cout << "\n\n      dequeuing      " << arr[front] << "\n\n";
32
33         front = (front + 1) % max_size;
34         cur_size--;
35     }
36 }
37
38
39
40
41
42 template <class T>
43 void queue<T>::enqueue(T item)
44 {

```

Compiler Resources CompileLog Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q8\Project3.exe
- Output Size: 2.00583076477051 MiB
- Compilation Time: 2.72s

Line: 69 Col: 2 Sel: 0 Lines: 79 Length: 1090 Insert Done parsing in 0.032 seconds

Type here to search

Project3 - [Project3.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp queue.h queue.cpp

```

1 #include "queue.h"
2 #include <iostream>
3 #include <cstdlib>
4 using namespace std;
5
6 template <class T>
7 T queue<T>::operator[](int i)
8 {
9     | return arr[i];
10 }
11
12
13 template <class T>
14 queue<T>::queue(int sz)
15 {
16     arr = new T[sz];
17     max_size = sz;
18     front = 0;
19     rear = -1;
20     cur_size = 0;
21 }
22

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q8\Project3.exe
- Output Size: 2.00583076477051 MiB
- Compilation Time: 2.72s

Type here to search

Line: 69 Col: 2 Sel: 0 Lines: 79 Length: 1090 Insert Done parsing in 0.032 seconds

Project3 - [Project3.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp queue.h queue.cpp

```

17
18
19 public:
20     | queue(int size = 0);
21
22     void dequeue();
23
24     void enqueue(T);
25
26     int size();
27
28     int underflow();
29
30     int overflow();
31
32     T operator[](int);
33
34 };
35
36 #endif
37

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q8\Project3.exe
- Output Size: 2.00583076477051 MiB
- Compilation Time: 2.72s

Type here to search

Line: 20 Col: 5 Sel: 0 Lines: 37 Length: 429 Insert Done parsing in 0.032 seconds

Project3 - [Project3.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp queue.h queue.cpp

```

1 #ifndef QUEUE_H
2 #define QUEUE_H
3
4 template <class T>
5 class queue
6 {
7     T *arr;
8
9     int cur_size;
10
11    int max_size;
12
13    int front;
14
15    int rear;
16
17
18
19 public:
20
21     queue(int size = 0);
22

```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q8\Project3.exe
- Output Size: 2.00583076477051 MiB
- Compilation Time: 2.72s

Type here to search

Line: 20 Col: 5 Sel: 0 Lines: 37 Length: 429 Insert Done parsing in 0.032 seconds

Project3 - [Project3.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp queue.h queue.cpp

```

28
29
30 for(int i=0;i<size;i++)
31 {
32     for(int j=i;j<size;j++)
33     {
34         if(q[i]==q[j] && i!=j)
35             cout<<"\n\n      "q[i]<<" is duplicated \n\n";
36     }
37 }
38
39
40 cout<<" \n\n\n      dequeuing elements \n\n\n";
41
42 for(int i=0;i<size;i++)
43 {
44     q.dequeue();
45 }
46
47 return 0;
48

```

Compiler Resources CompileLog ✓ Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q8\Project3.exe
- Output Size: 2.00583076477051 MiB
- Compilation Time: 2.72s

Type here to search

Line: 43 Col: 23 Sel: 0 Lines: 48 Length: 994 Insert Done parsing in 0.015 seconds

Project3 - [Project3.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp queue.h queue.cpp

```

17
18
19 if (q.underflow()) {
20     cout << "\n\n\n      The queue is underflow, exiting \n";return 0;
21 }
22 else {
23     cout << "\n\n\n      The queue is not underflow, proceeding ..... \n\n";
24 }
25
26 cout<<"\n\n\n      checking for duplicates : \n\n\n";
27
28
29 for(int i=0;i<size;i++)
30 {
31     for(int j=i;j<size;j++)
32     {
33         if(q[i]==q[j] && i!=j)
34             {cout<<"\n\n      "<<q[i]<<" is duplicated \n\n";}
35     }
36 }
37
38

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q8\Project3.exe
- Output Size: 2.00583076477051 MiB
- Compilation Time: 2.72s

Line: 43 Col: 23 Sel: 0 Lines: 48 Length: 994 Insert Done parsing in 0.015 seconds 22:29 09-04-2021

Type here to search

Project3 - [Project3.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIM-GCC 4.9.2 64-bit Release

Project Classes Debug main.cpp queue.h queue.cpp

```

1 #include <iostream>
2 #include <cstring>
3 using namespace std;
4 #include "queue.h"
5
6
7 int main()
8 {
9
10    cout<<"\n\n\n      enter size for queue of strings      " ;int size=0;
11    cin>>size;string s;
12    queue<string> q(size);
13
14    for(int i=0;i<size;i++)
15        cout<<"\n\n\n      enter element to enqueue      ";cin>>s;q.enqueue(s);
16
17
18
19 if (q.underflow()) {
20     cout << "\n\n\n      The queue is underflow, exiting \n";return 0;
21 }
22 else {

```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q8\Project3.exe
- Output Size: 2.00583076477051 MiB
- Compilation Time: 2.72s

Line: 43 Col: 23 Sel: 0 Lines: 48 Length: 994 Insert Done parsing in 0.015 seconds 22:29 09-04-2021

Type here to search

Project3 - [Project3.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TIK-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug main.cpp queue.h queue.cpp

```
59
60     template <class T>
61     int queue<T>::size() {
62         return cur_size;
63     }
64
65
66     template <class T>
67     int queue<T>::underflow() {
68         return (size() == 0);
69     }
70
71
72     template <class T>
73     int queue<T>::overflow() {
74         return (size() == max_size);
75     }
76
77
78     template class queue<string>;
79
```

Compiler Resources Compile Log Debug Find Results Close

About Compilation

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\dev\q8\Project3.exe
- Output Size: 2.00583076477051 MiB
- Compilation Time: 2.72s

Line: 69 Col: 2 Sel: 0 Lines: 79 Length: 1090 Insert Done parsing in 0.032 seconds 22:30 09-04-2021 ENG

Type here to search

```
D:\dev\q8\Project3.exe

checking for duplicates :

today is duplicated

yesterday is duplicated

dequeuing elements

dequeuing today

dequeuing yesterday

dequeuing today

dequeuing mystery

dequeuing yesterday

Process exited after 73.99 seconds with return value 0
Press any key to continue . . .
```

```
D:\dev\q8\Project3.exe
enter element to enqueue      today

enqueueing      today

enter element to enqueue      mystery

enqueueing      mystery

enter element to enqueue      yesterday

enqueueing      yesterday

The queue is not underflow, proceeding ......

checking for duplicates :

today is duplicated

yesterday is duplicated

dequeuing elements
```

```
D:\dev\q8\Project3.exe

enter size for queue of strings      5

enter element to enqueue      today

enqueuing      today

enter element to enqueue      yesterday

enqueuing      yesterday

enter element to enqueue      today

enqueuing      today

enter element to enqueue      mystery

enqueuing      mystery

enter element to enqueue      yesterday

enqueuing      yesterday

D:\dev\q4\Project7.exe

Type here to search  22:33  09-04-2021

class members of car: Wheels* wheels, Engine engine, GearBox* gbox

enter wheels spoke numbers : 4

enter gearbox ratio : 5.7

enter engine model : 7789

car.wheels->get_spoke_num() 4

car.engine.get_model() 7789

car.gbox->get_gear_ratio() 5.7

Process exited after 16.26 seconds with return value 0
Press any key to continue . . .

D:\dev\q4\Project7.exe

Type here to search  23:05  09-04-2021
```

```
D:\dev\q8\Project3.exe

checking for duplicates :

good is duplicated

evening is duplicated

dequeuing elements

dequeuing    good

dequeuing    morning

dequeuing    good

dequeuing    evening

dequeuing    cold

dequeuing    evening

-----
Process exited after 72.23 seconds with return value 0
Press any key to continue . . .
```

```
D:\dev\q8\Project3.exe

The queue is not underflow, proceeding . . .

checking for duplicates :

good is duplicated

evening is duplicated

dequeuing elements

dequeuing    good

dequeuing    morning

dequeuing    good

dequeuing    evening

dequeuing    cold

dequeuing    evening
```

```
D:\dev\q8\Project3.exe
enqueueing      good

enter element to enqueue      evening

enqueueing      evening

enter element to enqueue      cold

enqueueing      cold

enter element to enqueue      evening

enqueueing      evening

The queue is not underflow, proceeding ......

checking for duplicates :

good is duplicated

evening is duplicated

D:\dev\q8\Project3.exe
enter size for queue of strings      6

enter element to enqueue      good

enqueueing      good

enter element to enqueue      morning

enqueueing      morning

enter element to enqueue      good

enqueueing      good

enter element to enqueue      evening

enqueueing      evening

enter element to enqueue      cold

enqueueing      cold
```

