

Name: Swaminathan Navinashok

Roll no.: 2019115126

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- 1) Write a C++ program to overload various functions to calculate the area of different polygons**

“polygon.h”

```
#ifndef POLYGON_H
#define POLYGON_H

class polygon
{
public:
    void area(int,int,int); //trapezium
    void area(int,int,double); //triangle
    void area(int,int); //rectangle
```

```
void area(int);//square  
};
```

```
#endif
```

“polygon.cpp”

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

```
void polygon::area(int b1,int b2,int h )//trapezium  
{  
    cout<<((float)((b1+b2)*h))/2;  
}
```

```
void polygon::area(int l,int b)//rectangle  
{  
    cout<<l*b;  
}
```

```
void polygon::area(int b,int h,double c)//triangle
{
    cout<<b*h*c;
}
```

```
void polygon::area(int l)//square
{
    cout<<l*l;
}
```

“main.cpp”

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

```
int main()
```

```
{
```

```
    polygon x;int flag=1;
```

```
    int i=0;
```

```
    do
```

```
{
```

```
cout<<"\n\nenter choice \n\n 1. area of rectangle\n\n 2. area of square\n\n 3.\narea of triangle\n\n 4.area of trapezium \n\n press 0 to exit \n\n\n\n ";
```

```
cin>>i;
switch(i)
{
    case 0: {  flag=0;
                cout<<"\n\nexiting\n\n ";break;
            }
```

```
        case 1:
        { int l=0,b=0;
            cout<<"\n enter length \n";
            cin>>l;
            cout<<"\n enter breadth \n ";
            cin>>b;cout<<"\n\n\n ";
            x.area(l,b);
            break;
        }
```

```
        case 2:
        {
            int l=0;
            cout<<"\n enter length \n ";
            cin>>l;cout<<"\n\n\n ";
            x.area(l);
            break;
        }
```

case 3:

```
{  
    double c=0.5,int b=0,h=0;  
  
    cout<<"\n enter breadth \n ";  
    cin>>b;  
  
    cout<<"\n enter height \n ";  
    cin>>h;cout<<"\n\n\n  ";  
    x.area(b,h,c);  
    break;  
}
```

case 4:

```
{  
    int b1=0,b2=0,h=0;  
  
    cout<<"\n  enter the value of lower  
base\n";  
  
    cin>>b1;  
  
    cout<<"\n  enter the value of upper base\n";  
    cin>>b2;  
  
    cout<<"\n  enter height\n";  
  
    cin>>h;cout<<"\n\n\n  ";  
    x.area(b1,b2,h);  
    break;  
}
```

default:

```
{ flag=0;  
  
    cout<<"\n\n invalid choice \n\n";
```

```
    }  
  
}  
  
if(flag)  
{  
    cout<<" is the area in units \n";  
}  
  
}  
  
}while(i!=0);  
  
return 0;  
}
```

Code screenshots

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

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug

```
Project7
├── main.cpp
└── polygon.h
    └── polygon.cpp

53 }  
54  
55 case 4:  
56 {  
57     int b1=0,b2=0,h=0;  
58     cout<<"\n enter the value of lower base\n";  
59     cin>>b1;  
60     cout<<"\n enter the value of upper base\n";  
61     cin>>b2;  
62     cout<<"\n enter height\n";  
63     cin>>h;cout<<"\n\n\n      ";  
64     x.area(b1,b2,h);  
65     break;  
66  
67 }  
68 default:  
69 {  
70     flag=0;  
71     cout<<"\n \n invalid choice \n\n";  
72 }  
73  
74 }  
75  
76 if(flag)  
77 {  
78     cout<<" is the area in units \n";  
79 }  
80  
81  
82  
83  
84 }while(i!=0);  
85  
86  
87 return 0;  
88 }
```

Line: 27 Col: 36 Sel: 0 Lines: 88 Length: 2355 Insert Done parsing in 0.031 seconds



Type here to search



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

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug main.cpp Student.cpp Student.h main.cpp polygon.h polygon.cpp

Project7
main.cpp
polygon.h
polygon.cpp

```
1 #ifndef POLYGON_H
2 #define POLYGON_H
3
4 class polygon
{
5     public:
6
7         void area(int,int,int); //trapezium
8
9
10        void area(int,int,double); //triangle
11
12        void area(int,int); //rectangle
13
14
15        void area(int); //square
16
17    };
18
19
20 #endif
```

Line: 7 Col: 16 Sel: 0

Lines: 20

Length: 297

Insert

Done parsing in 0.03



Type here to search



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

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

Project7
main.cpp
polygon.h
polygon.cpp

```
1 #include "polygon.h"
2 #include<iostream>
3 using namespace std;
4
5 void polygon::area(int b1,int b2,int h )//trapezium
6 {
7     cout<<((float)((b1+b2)*h))/2;
8 }
9
10
11 void polygon::area(int l,int b)//rectangle
12 {
13     cout<<l*b;
14 }
15
16 void polygon::area(int b,int h,double c)//triangle
17 {
18     cout<<b*h*c;
19 }
20
21 void polygon::area(int l)//square
22 {
23     cout<<l*l;
24 }
```

Line: 11

Col: 43

Sel: 0

Lines: 24

Length: 384

Insert

Done parsing in 0.031 se

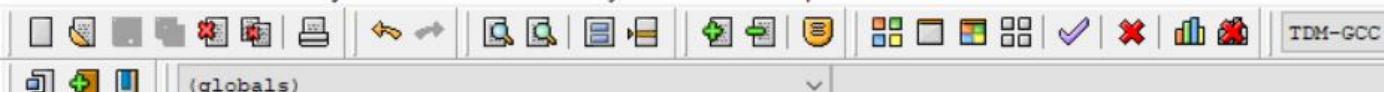


Type here to search



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

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug main.cpp Student.cpp Student.h main.cpp polygon.h polygon.cpp

Project7

main.cpp polygon.h polygon.cpp

```
1 #include<iostream>
2 #include "polygon.h"
3 using namespace std;
4
5 int main()
6 {
7
8     polygon x;int flag=1;
9
10    int i=0;
11    do
12    {
13
14        cout<<"\n\nenter choice \n\n 1. area of rectangle\n
15
16
17        cin>>i;
18        switch(i)
19        {
20
21            case 0: {   flag=0;
22                        cout<<"\n\nexiting\n\n ";break;
23
24            case 1: {   int l=0,b=0;
25                        cout<<"\n enter length \n";
26                        cin>>l;
27                        cout<<"\n enter breadth \n ";
28                        cin>>b;cout<<"\n\n\n      ";
29                        x.area(l,b);
30                        break;
31
32            case 2: {
33
34                int l=0;
```

Line: 27

Col: 36

Sel: 0

Lines: 88

Length: 2355

Insert

Done parsing in 0.031 seconds



Type here to search



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

File Edit Search View Project Execute Tools AStyle Window Help

The screenshot shows the Dev-C++ IDE interface with the following details:

- Project Explorer:** Shows "Project7" with files: main.cpp, Student.cpp, Student.h, main.cpp, polygon.h, and polygon.cpp.
- Code Editor:** Displays C++ code for calculating the area of different polygons based on user input. The code uses a switch statement with four cases:
 - Case 1: Calculates the area of a rectangle (x.area(1,b); break;).
 - Case 2: Prompts for length and calculates the area of a rectangle (int l=0; cout<<"\n enter length \n "; cin>>l; cout<<"\n\n\n "; x.area(l); break;).
 - Case 3: Prompts for breadth and height and calculates the area of a trapezoid (double c=0.5; int b=0, h=0; cout<<"\n enter breadth \n "; cin>>b; cout<<"\n enter height \n "; cin>>h; cout<<"\n\n\n "; x.area(b,h,c); break;).
 - Case 4: Prompts for lower and upper bases and height and calculates the area of a trapezoid (int b1=0, b2=0, h=0; cout<<"\n enter the value of lower base\n "; cin>>b1; cout<<"\n enter the value of upper base\n "; cin>>b2; cout<<"\n enter height\n "; cin>>h; cout<<"\n\n\n "; x.area(b1,b2,h); break;).
- Status Bar:** Shows "Line: 27 Col: 36 Sel: 0 Lines: 88 Length: 2355 Insert Done parsing in 0.031 seconds".
- Search Bar:** Contains "Type here to search".
- Toolbars and Menus:** Standard Dev-C++ menu bar and toolbars.
- Compiler Information:** Shows "TDM-GCC 4.9.2 64-bit" in the top right corner.

Output

Select E:\DEVcpp files\17 march\q1\Project7.exe

25 is the area in units

enter choice

1. area of rectangle

2. area of square

3. area of triangle

4.area of trapezium

press 0 to exit

3

enter breadth

5

enter height

6

15 is the area in units

enter choice

1. area of rectangle

2. area of square

3. area of triangle

4.area of trapezium

press 0 to exit

4

enter the value of lower base

5

1 Select E:\DEVcpp files\17 march\q1\Project7.exe

15 is the area in units

enter choice

1. area of rectangle

2. area of square

3. area of triangle

4.area of trapezium

press 0 to exit

4

enter the value of lower base

5

enter the value of upper base

6

enter height

3

16.5 is the area in units

enter choice

1. area of rectangle

2. area of square

3. area of triangle

4.area of trapezium

press 0 to exit

0

>Select E:\DEVcpp files\17 march\q1\Project7.exe

4

enter the value of lower base

5

enter the value of upper base

6

enter height

3

16.5 is the area in units

enter choice

1. area of rectangle

2. area of square

3. area of triangle

4.area of trapezium

press 0 to exit

0

exiting

Process exited after 43.37 seconds with return value 0
Press any key to continue . . . ■

E:\DEVcpp files\17 march\q1\Project7.exe

```
enter choice  
1. area of rectangle  
2. area of square  
3. area of triangle  
4.area of trapezium  
press 0 to exit
```

1

enter length

4

enter breadth

5

20 is the area in units

```
enter choice
```

```
1. area of rectangle  
2. area of square  
3. area of triangle  
4.area of trapezium
```

press 0 to exit

2

```
enter length  
5
```

E:\DEVcpp files\17 march\q1\Project7.exe

20 is the area in units

enter choice

1. area of rectangle
2. area of square
3. area of triangle
- 4.area of trapezium

press 0 to exit

2

enter length

5

25 is the area in units

enter choice

1. area of rectangle
2. area of square
3. area of triangle
- 4.area of trapezium

press 0 to exit

3

enter breadth

5

enter height

6

2. Write a C++ program to find out the distance between two objects using friend functions.

"obj3D.h"

```
#ifndef OBJ3D_H
#define OBJ3D_H

class obj3D
{
private:
    double x,y,z;//3d coordinates

public:
    obj3D();
    void get();

    friend double dist(obj3D &,obj3D &); // can access x,y,z
};

};
```

```
#endif
```

"obj3D.cpp"

```
#include "obj3D.h"  
#include<iostream>  
#include<cmath> //has hypot f()  
using namespace std;
```

```
obj3D::obj3D()
```

```
{  
    x=0,y=0,z=0;  
}
```

```
void obj3D::get()
```

```
{  
    cout<<"enter x,y,z co-ordinate in 3d \n\n";  
    cout<<"\n    x:  ";  
    cin>>x;  
    cout<<"\n\n    y:  ";  
    cin>>y;  
    cout<<"\n\n    z:  ";  
    cin>>z;  
}
```

```
double dist(obj3D &o1,obj3D &o2)//not a mem f() so no scope resolution operator needed
```

```
{  
    int xd=0,yd=0,zd=0;
```

```

xd=o2.x-o1.x;

yd=o2.y-o1.y;

zd=o2.z-o1.z; double xy=hypot(xd,yd);double xyz= hypot (xy,zd);

//hypot(x,y) returns (root (x,y)) , and distance between two point= root of sum of
square of difference between each coordinate

return xyz;

}

```

“main.cpp”

```

#include "obj3D.h"

#include<iostream>

using namespace std ;

double dist(obj3D &,obj3D &);

int main()

{

    int c=0;obj3D o1,o2;

    do

    {

        cout<<"\n\n\n for object 1 ";

        o1.get();

        cout<<"\n\n\n for object 2 ";

```

```
    o2.get();  
  
    cout<<"\n\n  "<<dist(o1,o2)<<"  is the distance between the objects ";  
  
    cout<<"\n\n do you wish to continue? press 0 to stop \n\n";cin>>c;  
  
}  
  
}while(c!=0);  
  
return 0;  
}
```

Code screenshot:

Project8 - [Project8.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

```
1 #include "obj3D.h"
2 #include<iostream>
3 #include<cmath> //has hypot f()
4 using namespace std;
5
6
7 obj3D::obj3D()
8 {
9     x=0,y=0,z=0;
10 }
11
12 void obj3D::get()
13 {
14     cout<<"enter x,y,z co-ordinate in 3d \n\n";
15     cout<<"\n      x : ";
16     cin>>x;
17     cout<<"\n\n      y : ";
18     cin>>y;
19     cout<<"\n\n      z : ";
20     cin>>z;
21 }
22
23
24 double dist(obj3D &o1,obj3D &o2)//not a mem f() so no s
25 {
26     int xd=0,yd=0,zd=0;
27
28     xd=o2.x-o1.x;
29
30     yd=o2.y-o1.y;
31
32     zd=o2.z-o1.z; double xyz=hypot(xd,yd);double xyz;
33     //hypot(x,y) returns (root (x,y)) , and distance
34
35     return xyz;
36 }
```

Compiler Resources Compile Log Debug Find Results

Line: 8 Col: 2 Sel: 0 Lines: 37 Length: 714 Insert Done parsing in 0.016

Type here to search

Project8 - [Project8.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



Project Classes Debug

Project8
main.cpp obj3D.cpp obj3D.h

```
1 #include "obj3D.h"
2 #include<iostream>
3 using namespace std ;
4
5
6
7 double dist(obj3D &,obj3D &);
8 int main()
9 {
10     int c=0,obj3D o1,o2;
11     do
12     {
13
14         cout<<"\n\n\n for object 1 ";
15         o1.get();
16
17         cout<<"\n\n\n for object 2 ";
18         o2.get();
19
20         cout<<"\n\n      "<<dist(o1,o2)<<
21
22         cout<<" \n\n do you wish to continue ";
23
24
25     }while(c!=0);
26
27
28
29
30
31
32
33
```

Compiler Resources Compile Log Debug Find Results

Line: 30 Col: 1 Sel: 0 Lines: 33 Length: 502 Insert Done parsing in 0



Type here to search



Project8 - [Project8.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

main.cpp Student.cpp Student.h main.cpp obj3D.h obj3D.cpp stl_i

Project8

main.cpp
obj3D.cpp
obj3D.h

```
1 ifndef OBJ3D_H
2 define OBJ3D_H
3
4 class obj3D
5 {
6     private:
7         double x,y,z;//3d coordinates
8
9     public:
10        obj3D();
11
12        void get();
13
14        friend double dist(obj3D &,obj3D &);
15
16    };
17
18
19#endif
```

Compiler

Resources

Compile Log

Debug

Find Results

Line: 7

Col: 37

Sel: 0

Lines: 19

Length: 221

Insert

Done p



Type here to search



Output:

E:\DEVcpp files\17 march\q2\Project8.exe

```
for object 1 enter x,y,z co-ordinate in 3d
```

x : 4

y : 5

z : 15

```
for object 2 enter x,y,z co-ordinate in 3d
```

x : 50

y : 51

z : 23

65.5439 is the distance between the objects

```
do you wish to continue? press 0 to stop
```

1

```
for object 1 enter x,y,z co-ordinate in 3d
```

x : 1

y : 1

z : 1

```
for object 2 enter x,y,z co-ordinate in 3d
```



E:\DEVcpp files\17 march\q2\Project8.exe

```
for object 1 enter x,y,z co-ordinate in 3d
```

```
x : 3
```

```
y : 4
```

```
z : 8
```

```
for object 2 enter x,y,z co-ordinate in 3d
```

```
x : 9
```

```
y : 4
```

```
z : 2
```

```
8.48528 is the distance between the objects
```

```
do you wish to continue? press 0 to stop
```

```
1
```

```
for object 1 enter x,y,z co-ordinate in 3d
```

```
x : 4
```

```
y : 5
```

```
z : 15
```



Type here to search



E:\DEVcpp files\17 march\q2\Project8.exe

23

65.5439 is the distance between the objects

do you wish to continue? press 0 to stop

1

for object 1 enter x,y,z co-ordinate in 3d

x_i = 1

v i 1

for object 2 enter x,y,z co-ordinate in 3d

x : 10

y : 10

z : 10

15.5885 is the distance between the objects

do you wish to continue? press 0 to stop

0

Process exited after 135.5 seconds with return value 0
Press any key to continue . . .



E:\DEVcpp files\17 march\q2\Project8.exe

for object 1 enter x,y,z co-ordinate in 3d

x : 5

y : 6

z : 7

for object 2 enter x,y,z co-ordinate in 3d

x : 8

y : 10

z : 14

8.60233 is the distance between the objects

do you wish to continue? press 0 to stop

0

Process exited after 88.62 seconds with return value 0
Press any key to continue . . .

3. Write a C++ program to multiply two fractions using a friend class.

“fractions.h”

```
#ifndef FRACTIONS_H
#define FRACTIONS_H

class product;

class fractions
{
    // express fractions as n/d where n is numerator,d is denominator
    friend class product;
    private:
        int n;
        int d;

    public:
        void set();

        void reduce();// to cut off common factors between n and d

        void display();
}
```

```
};  
#endif
```

“fractions.cpp”

```
#include "fractions.h"  
  
#include<iostream>  
#include <algorithm>// to find gcd of numerator,denominator  
  
using namespace std;  
  
void fractions::set()  
{  
    cout<<"\n\n enter numerator :";cin>>n;  
    cout<<"\n\n enter denominator :";cin>>d;  
}  
  
void fractions::reduce()// to cut off common factors between n and d  
{  
    int x= __gcd(n,d);//defined in <algorithm>  
    n=n/x;  
    d=d/x;  
}  
  
void fractions::display()  
{  
    if(d!=1)
```

```

    {
        cout<<" "<<n<<" / "<<d;
    }
else
{
    cout<<" "<<n;// the numerator is a multiple of the denominator
}
}

```

“products.h”

```

#ifndef PRODUCT_H
#define PRODUCT_H
#include "fractions.h"//imp
class product
{
public:
    fractions* mply(fractions &f1,fractions &f2) ;
};

#endif

```

“products.cpp”

```
#include "product.h"
#include<iostream>
#include <algorithm>// to find gcd of numerator,denominator

using namespace std;

fractions* product::mply(fractions &f1,fractions &f2)
{
    fractions* f3= new fractions;

    f3->n=f1.n * f2.n;
    f3->d=f1.d * f2.d;
    f3->reduce();
    return f3;

}
```

“main.cpp”

```
#include<iostream>
#include <algorithm>// to find gcd of numerator,denominator
#include "fractions.h"
#include"product.h"
using namespace std;
```

```
main()
{
    fractions f1,f2; product p;fractions *f3;
    int c=0;
    do
    {
        cout<<"\n\n\n for object 1 :";f1.set();
        cout<<"\n\n\n for object 2 :";f2.set();

        f3=p.mply(f1,f2);
        cout<<" \n\n\n the product is ";
        f3->display();
        delete f3;
        cout<<"\n\n\n press 0 to quit else repeat again?\n";cin>>c;
        }while(c!=0);

    return 0;
}
```

Code screenshots:

Project9 - [Project9.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug main.cpp Student.cpp Student.h stl_iterator_base_types.h main.cpp fractions.h

Project9

- main.cpp
- fractions.h
- fractions.cpp
- product.h
- product.cpp

```
1 #ifndef PRODUCT_H
2 #define PRODUCT_H
3 #include "fractions.h" //imp
4 class product
5 {
6
7     public:
8
9
10    fractions* mply(fractions &f1,fractions &f2) ;
11
12
13
14 };
15
16#endif
```

Compiler Resources Compile Log Debug Find Results

Line: 8 Col: 12 Sel: 0 Lines: 16 Length: 197 Insert Done parsing in 0



Type here to search



Project9 - [Project9.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

- Project9
 - main.cpp
 - fractions.h
 - fractions.cpp
 - product.h
 - product.cpp

```
1 #include "fractions.h"
2 #include<iostream>
3 #include <algorithm> // to find gcd of numerator, denominator
4
5 using namespace std;
6
7 void fractions::set()
8 {
9     cout<<"\n\n    enter numerator      : ";
10    cout<<"\n\n    enter denominator   : ";
11 }
12
13 void fractions::reduce() // to cut off common factors
14 {
15     int x= __gcd(n,d); //defined in <algorithm>
16     n=n/x;
17     d=d/x;
18 }
19
20
21 void fractions::display()
22 {
23     if(d!=1)
24     {
25         cout<<"    " <<n<< " / " <<d;
26     }
27     else
28     {
29         cout<<"    " <<n; // the numerator is 1
30     }
31 }
```

Compiler Resources Compile Log Debug Find Results

Line: 6

Col: 1

Sel: 0

Lines: 31

Length: 620

Insert

Done parsing

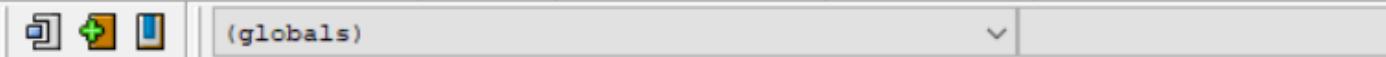


Type here to search



Project9 - [Project9.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



Project Classes Debug

Project9
main.cpp
fractions.h
fractions.cpp
product.h
product.cpp

```
1 #ifndef FRACTIONS_H
2 #define FRACTIONS_H
3
4 class product;
5 class fractions
6 {
7     // express fractions as n/d where n is num
8     friend class product;
9     private:
10         int n;
11         int d;
12
13     public:
14         void set();
15
16         void reduce(); // to cut off common fa
17
18         void display();
19
20
21     };
22 #endif
```

Compiler Resources Compile Log Debug Find Results

Line: 21

Col: 3

Sel: 0

Lines: 22

Length: 380

Insert

Done pa



Type here to search



Project9 - [Project9.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

main.cpp Student.cpp Student.h stl_iterator_base_types.h main.cpp fraction

Project9

main.cpp
fractions.h
fractions.cpp
product.h
product.cpp

```
1 #include<iostream>
2 #include <algorithm> // to find gcd of numerator,denominator
3 #include "fractions.h"
4 #include "product.h"
5 using namespace std;
6
7 main()
8 {
9     fractions f1,f2; product p;fractions *f3;
10    int c=0;
11    do
12    {
13
14        cout<<"\n\n\n for object 1 :";f1.set();
15        cout<<"\n\n\n for object 2 :";f2.set();
16
17        f3=p.mply(f1,f2);
18        cout<<" \n\n\n the product is ";
19        f3->display();
20        delete f3;
21        cout<<"\n\n\n press 0 to quit else repeat again";
22        }while(c!=0);
23
24
25
26    return 0;
27 }
```

Compiler

Resources

Compile Log

Debug

Find Results

Line:

5

Col: 21

Sel: 0

Lines: 27

Length: 551

Insert

Done parsing



Type here to search



Project9 - [Project9.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

Project Classes Debug main.cpp Student.cpp Student.h stl_iterator_base_types.h main.cpp fractions.h fra

Project9

- main.cpp
- fractions.h
- fractions.cpp
- product.h
- product.cpp

```
1 #include "product.h"
2 #include<iostream>
3 #include <algorithm> // to find gcd of numerator, denominator
4
5 using namespace std;
6
7 fractions* product::mply(fractions &f1, fractions &f2)
8 {
9     fractions* f3 = new fractions;
10    f3->n=f1.n * f2.n;
11    f3->d=f1.d * f2.d;
12    f3->reduce();
13    return f3;
14
15
16
17 }
```

Compiler Resources Compile Log Debug Find Results

Line: 6 Col: 1 Sel: 0 Lines: 17 Length: 372 Insert Done parsing in 0.015 s

Type here to search

Outputs:

```
E:\DEVcpp files\17 march\q3\Project9.exe
```

```
the product is -1
```

```
press 0 to quit else repeat again?
```

```
2
```

```
for object 1 :
```

```
enter numerator : -5
```

```
enter denominator : 6
```

```
for object 2 :
```

```
enter numerator : -12
```

```
enter denominator : -10
```

```
the product is -1
```

```
press 0 to quit else repeat again?
```

```
1
```

```
for object 1 :
```

```
enter numerator : -7
```

```
enter denominator : -8
```

```
for object 2 :
```

```
enter numerator : 8
```

```
enter denominator : -13
```

E:\DEVcpp files\17 march\q3\Project9.exe

for object 1 :

enter numerator :5

enter denominator :10

for object 2 :

enter numerator :10

enter denominator :5

the product is 1

press 0 to quit else repeat again?

2

for object 1 :

enter numerator :-1

enter denominator :-3

for object 2 :

enter numerator :3

enter denominator :-1

the product is -1

press 0 to quit else repeat again?

E:\DEVcpp files\17 march\q3\Project9.exe

```
for object 1 :  
enter numerator      :2  
  
enter denominator   :3  
  
for object 2 :  
enter numerator      :6  
  
enter denominator   :12
```

the product is 1 / 3

press 0 to quit else repeat again?

5

```
for object 1 :  
enter numerator      :5  
  
enter denominator   :10
```

```
for object 2 :  
enter numerator      :10  
  
enter denominator   :5  
  
the product is    1
```

E:\DEVcpp files\17 march\q3\Project9.exe

enter numerator : -12

enter denominator : -10

the product is -1

press 0 to quit else repeat again?

1

for object 1 :

enter numerator : -7

enter denominator : -8

for object 2 :

enter numerator : 8

enter denominator : -13

the product is 7 / -13

press 0 to quit else repeat again?

0

Process exited after 143.9 seconds with return value 0
Press any key to continue . . .

4)Write a C++ program to convert into centimeters into meters and meters into centimeters by making a function being friend to more than one classes

“centimeter.h”

```
#ifndef CENTIMETER_H
#define CENTIMETER_H

class centimeter
{
    friend void convert(centimeter,meter,int);

    private:
        double cm;

    public:
        void get(double c);

};

#endif
```

“meter.h”

```
#ifndef METER_H  
#define METER_H  
  
#include "centimeter.h"  
  
class meter  
{  
  
    friend void convert(centimeter,meter,int);  
  
    private:  
        double mtr;  
  
    public:  
        void get(double m);  
};
```

#endif

“centimeter.cpp”

```
#include "centimeter.h"  
  
void centimeter::get(double c){cm=c;}
```

“meter.cpp”

```
#include "meter.h"  
  
void meter::get(double m){mtr=m;}
```

“main.cpp”

```

#include"centimeter.h"
#include"meter.h"
#include<iostream>
using namespace std;

//friend function:

void convert(centimeter obcm, meter obm,int flag)
{
    if(flag)//flag=1 m to cm,flag=0 cm to m
    {
        obcm.cm=100*obm.mtr;cout<<" The Value Of centimeter is "<<obcm.cm<<endl;
    }
    else
    {
        obm.mtr=obcm.cm/100;cout<<" The Value Of meter is "<<obm.mtr<<endl;
    }
}

main()
{
    double m=0,cm=0;int c=0;
    centimeter obcm;
    meter obm;
    do
    {
        cout<<"\n\n\n 1. convert m to cm \n\n 2. cm to m press \n\n 0 to quit \n\n"; cin>>c;
        switch(c)
        {
            case 0: cout<<" \n\n exiting \n";break;
            case 1: cout<<" \n enter m: ";cin>>m;obm.get(m);convert(obcm,obm,1); break;
        }
    }
}

```

```
case 2: cout<<" \n enter cm: ";cin>>cm;obcm.get(cm);convert(obcm,obm,0);
break;

default: cout<<"invalid choice";break;

}

}

while(cl!=0);

return 0;
}
```

Code:

Project10 - [Project10.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

Project10

- main.cpp
- centimeter.h
- centimeter.cpp
- meter.h
- meter.cpp

```
1 #include "centimeter.h"
2 #include "meter.h"
3 #include <iostream>
4 using namespace std;
5
6 //friend function:
7 void convert(centimeter obcm, meter obm, int flag)
8 {
9     if(flag) //flag=1 m to cm, flag=0 cm to m
10    {
11        obcm.cm=100*obm.mtr; cout<<" The Value Of centimeter is "<<obcm.cm<<endl;
12    }
13    else
14    {
15        obm.mtr=obcm.cm/100; cout<<" The Value Of meter is "<<obm.mtr<<endl;
16    }
17
18
19 }
20
21 main()
22 {
23     double m=0, cm=0; int c=0;
24     centimeter obcm;
25     meter obm;
26     do
27     {
28
29         cout<<"\n\n 1. convert m to cm \n\n 2. cm to m press \n\n 0 to quit \n\n";
30         switch(c)
31         {
32             case 0: cout<<" \n\n exiting \n"; break;
33             case 1: cout<<" \n enter m:  "; cin>>m; obm.get(m); convert(obcm, obm, 1); break;
34             case 2: cout<<" \n enter cm:  "; cin>>cm; obcm.get(cm); convert(obcm, obm, 0); break;
35             default: cout<<"invalid choice"; break;
36         }
37     }
38 }
```

Compiler Resources Compile Log Debug Find Results

Line: 23 Col: 29 Sel: 0 Lines: 45 Length: 950 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



Project Classes Debug

main.cpp

centimeter.h

centimeter.cpp

meter.h

meter.cpp

Project10

main.cpp
centimeter.h
centimeter.cpp
meter.h
meter.cpp

```
1 #ifndef CENTIMETER_H
2 #define CENTIMETER_H
3
4
5 class centimeter
6 {
7
8     friend void convert(centimeter,meter,int);
9
10    private:
11        double cm;
12
13    public:
14        void get(double c);
15
16    };
17 #endif|
```

Compiler

Resources

Compile Log

Debug

Find Results

Line: 17

Col: 7

Sel: 0

Lines: 17

Length: 217

Insert

Done parsing in



Type here to search



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

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

main.cpp centimeter.h centimeter.cpp meter.h meter.cpp

Project10
main.cpp
centimeter.h
centimeter.cpp
meter.h
meter.cpp

```
1 #ifndef METER_H
2 #define METER_H
3 #include "centimeter.h"
4 class meter
5 {
6
7     friend void convert(centimeter,meter,int);
8
9     private:
10        double mtr;
11
12    public:
13        void get(double m);
14    };
15
16
17#endif
```

Compiler Resources Compile Log Debug Find Results

Line: 17

Col: 7

Sel: 0

Lines: 17

Length: 229

Insert

Done parsing



Type here to search



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

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

Project10

- main.cpp
- centimeter.h
- centimeter.cpp
- meter.h
- meter.cpp

main.cpp centimeter.h centimeter.cpp meter.h meter.cpp

```
1 #include "meter.h"
2
3 void meter::get(double m){mtr=m;}
```

Report Window

Compiler Resources

Compile Log

Debug



Find Results

Close

Shorten compiler paths

Compiling project changes...

- Project Filename: E:\DEVcpp files\17 march\q4\
- Compiler Name: TDM-GCC 4.9.2 64-bit Release

Building makefile...

- Filename: E:\DEVcpp files\17 march\q4\Makefile

Processing makefile...

- Makefile Processor: C:\Program Files (x86)\Dev
- Command: mingw32-make.exe -f "E:\DEVcpp files\

mingw32-make.exe: Nothing to be done for 'all'.

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: E:\DEVcpp files\17 march\q4\P
- Output Size: 1.84553241729736 MiB
- Compilation Time: 0.59s

Line: 3

Col: 36

Sel: 0

Lines: 3

Length: 59

Insert

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

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

Project10
main.cpp
centimeter.h
centimeter.cpp
meter.h
meter.cpp

main.cpp centimeter.h centimeter.cpp meter.h meter.cpp

```
1 #include "centimeter.h"  
2  
3 void centimeter::get(double c){cm=c;}
```

Report Window

Compiler Resources

Compile Log

Debug

Find Results

Close

Compiling project changes...

- Project Filename: E:\DEVcpp files\17 march\q4\
- Compiler Name: TDM-GCC 4.9.2 64-bit Release

Building makefile...

- Filename: E:\DEVcpp files\17 march\q4\Makefile

Processing makefile...

- Makefile Processor: C:\Program Files (x86)\Dev
- Command: mingw32-make.exe -f "E:\DEVcpp files\

mingw32-make.exe: Nothing to be done for 'all'.

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: E:\DEVcpp files\17 march\q4\P
- Output Size: 1.84553241729736 MiB
- Compilation Time: 0.59s

Line: 3

Col: 19

Sel: 0

Lines: 3

Length: 67

Insert

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

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project	Classes	Debug	main.cpp	centimeter.h	centimeter.cpp	meter.h	meter.cpp
---------	---------	-------	----------	--------------	----------------	---------	-----------

```
11     obcm.cm=100*obm.mtr;cout<<" The Value Of centimeter is "
12 }
13 else
14 {
15     obm.mtr=obcm.cm/100;cout<<" The Value Of meter is "
16 }
17
18
19 }
20
21 main()
22 {
23     double m=0,cm=0;int c=0;
24     centimeter obcm;
25     meter obm;
26     do
27     {
28
29         cout<<"\n\n\n 1. convert m to cm \n\n 2. cm to
30         switch(c)
31     {
32         case 0: cout<<" \n\n exiting \n";break;
33         case 1: cout<<" \n enter m:  ";cin>>m;obm.
34         case 2: cout<<" \n enter cm:  ";cin>>cm;obcm.
35         default: cout<<"invalid choice";break;
36     }
37
38
39     }while(c!=0);
40
41
42     return 0;
43 }
```

Compiler Resources Compile Log Debug Find Results

Line: 23 Col: 29 Sel: 0 Lines: 45 Length: 950 Insert Done parsing in 0.015 seconds



Type here to search



Output:

E:\DEVcpp files\17 march\q4\Project10.exe

1. convert m to cm

2. cm to m press

0 to quit

1

enter m: 5

The Value Of centimeter is 500

1. convert m to cm

2. cm to m press

0 to quit

2

enter cm: 5

The Value Of meter is 0.05

1. convert m to cm

2. cm to m press

0 to quit

1

enter m: 0.57

The Value Of centimeter is 57

1. convert m to cm

2. cm to m press

0 to quit

0

E:\DEVcpp files\17 march\q4\Project10.exe

1. convert m to cm

2. cm to m press

0 to quit

1

enter m: 3

The Value Of centimeter is 300

1. convert m to cm

2. cm to m press

0 to quit

2

enter cm: 32579

The Value Of meter is 325.79

1. convert m to cm

2. cm to m press

0 to quit

0

exiting

Process exited after 34.76 seconds with return value 0
Press any key to continue . . .

E:\DEVcpp files\17 march\q4\Project10.exe

1

```
enter m: 5
The Value Of centimeter is 500
```

1. convert m to cm

2. cm to m press

0 to quit

2

```
enter cm: 5
The Value Of meter is 0.05
```

1. convert m to cm

2. cm to m press

0 to quit

1

```
enter m: 0.57
The Value Of centimeter is 57
```

1. convert m to cm

2. cm to m press

0 to quit

0

exiting

```
Process exited after 50.05 seconds with return value 0
Press any key to continue . . .
```

5. Create two header files with proper arithmetic operations such as add, subtract, multiplication and division in the same namespace.

“main.cpp”

```
#include <iostream>
#include "header1.h"
#include "header2.h"
using namespace std;

void showChoices();

int main()
{
    double a, b; int c, d, e;

    do
    {
        cout << "\n\n\n enter choice \n\n 1: add \n\n 2: subtract \n\n 3: multiply \n\n 4: integer
divide \n\n 5:decimal division \n\n press 0 to quit\n\n" ;
        cin >> c;
        switch (c)
        {
            case 0: cout << "\n\n quitting \n\n"; break;
            case 1:
                cout << "\n enter two numbers : ";
                cin >> a >> b;
                cout << "\n \n sum : " << calc::add(a,b) ;
```

```

        break;

case 2:
    cout<<"\n enter two numbers : ";
    cin>>a>>b;
    cout<<"\n\n difference : "<<calc::subtract(a,b) ;
    break;

case 3:
    cout<<"\n enter two numbers : ";
    cin>>a>>b;
    cout<<"\n\n product : "<<calc::product(a,b) ;
    break;

case 4:
    cout<<"\n enter two numbers : ";
    cin>>e>>d;
    cout<<"\n\n quotient : "<<calc::quotient(e,d) ;
    cout<<"\n\n remainder :"<<calc::remainder(e,d) ;

    break;

case 5:
    cout<<"\n enter two numbers : ";
    cin>>a>>b;
    cout<<"\n\n result : "<<calc::decidiv(a,b);break;

default:
    cout<<"invalid choice";
}

}while (c!=0);

return 0;
}

```

"header1.h"

```
namespace calc
{
    double add(double a, double b)
    {
        return a+b;
    }

    double subtract(double a, double b)
    {
        return a-b;
    }

    double decidiv(double a,double b)
    {
        return a/b;
    }
}
```

"header2.h"

```
namespace calc
{
    double product(double a, double b)
    {
        return a*b;
    }
}
```

```
int quotient(int a, int b)
```

```
{
```

```
    return a/b;
```

```
}
```

```
int remainder(int a, int b)
```

```
{
```

```
    return a%b;
```

```
}
```

```
}
```

Code screenshot

DEV Project11 - [Project11.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



Project Classes Debug

main.cpp header1.h header2.h

Project11

```
1 #include <iostream>
2 #include "header1.h"
3 #include "header2.h"
4 using namespace std;
5
6 void showChoices();
7
8 int main()
9 {
10     double a, b; int c, d, e;
11
12     do
13     {
14         cout<<"\n\n\n enter choice \n\n  1: add \n\n  2: s
15         cin>>c;
16         switch (c)
17         {
18             case 0: cout<<"\n\n quitting \n\n"; break;
19             case 1:
20                 cout<<"\n enter two numbers : ";
21                 cin>>a>>b;
22                 cout<<"\n sum : "<<calc::add(a,b) ;
23                 break;
24             case 2:
25                 cout<<"\n enter two numbers : ";
26                 cin>>a>>b;
27                 cout<<"\n difference : "<<calc::subtract(a,
28                                         b);
29                 break;
30             case 3:
31                 cout<<"\n enter two numbers : ";
32                 cin>>a>>b;
33                 cout<<"\n\n product : "<<calc::product(a,b) ;
34                 break;
35         }
36     }
37 }
```

Compiler Resources Compile Log Debug Find Results

Line: 45 Col: 62 Sel: 0 Lines: 55 Length: 1160 Insert Done parsing in 0.015 seconds



Type here to search



Project11 - [Project11.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

+ Project11

main.cpp header1.h header2.h

```
1  namespace calc
2  {
3
4      double product(double a, double b)
5      {
6          return a*b;
7      }
8
9      int quotient(int a, int b)
10     {
11         int quotient (int a, int b)
12         return a/b;
13     }
14
15     int remainder(int a, int b)
16     {
17         return a%b;
18     }
19
20 }
```

Compiler

Resources

Compile Log

Debug

Find Results

Line: 9

Col: 24

Sel: 0

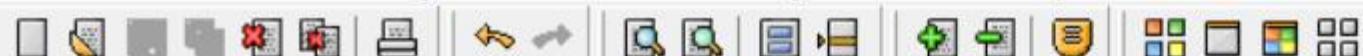
Lines: 20

Length: 185

Insert

Project11 - [Project11.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

+ Project11

main.cpp header1.h header2.h

```
1 namespace calc
2 {
3
4     double add(double a, double b)
5     {
6         return a+b;
7     }
8
9     double subtract(double a, double b)
10    {
11        return a-b;
12    }
13
14    double decidiv(double a,double b)
15    {
16        return a/b;
17    }
18 }
```

Compiler Resources Compile Log Debug Find Results Close

Abort Compilation

Shorten compiler paths

```
- Compiler Name: TDM-GCC 4.9.2 64-bit Release
Building makefile...
-----
- Filename: E:\DEVcpp files\17 march\q5\Makefile...
Processing makefile...
-----
- Makefile Processor: C:\Program Files (x86)\Dev-
- Command: mingw32-make.exe -f "E:\DEVcpp files\17
g++.exe -c main.cpp -o main.o -I"C:/Program Files
g++.exe main.o -o Project11.exe -L"C:/Program Fil
Compilation results...
-----
- Errors: 0
- Warnings: 0
- Output Filename: E:\DEVcpp files\17 march\q5\Pr
```

<

Line: 10

Col: 2

Sel: 0

Lines: 20

Length: 196

Insert

Project11 - [Project11.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

Project Classes Debug main.cpp header1.h header2.h

```
21     cin>>a>>b;
22     cout<<"\n\n sum : "<<calc::add(a,b) ;
23     break;
24 case 2:
25     cout<<"\n enter two numbers : ";
26     cin>>a>>b;
27     cout<<"\n\n difference : "<<calc::subtract(a,b)
28     break;
29 case 3:
30     cout<<"\n enter two numbers : ";
31     cin>>a>>b;
32     cout<<"\n\n product : "<<calc::product(a,b) ;
33     break;
34 case 4:
35
36     cout<<"\n enter two numbers : ";
37     cin>>e>>d;
38     cout<<"\n\n quotient : "<<calc::quotient(e,d)
39     cout<<"\n\n remainder :"<<calc::remainder(e,d)
40
41     break;
42 case 5:
43     cout<<"\n enter two numbers : ";
44     cin>>a>>b;
45     cout<<"\n\n result : "<<calc::decidiv(a,b);break
46 default:
47     cout<<"invalid choice";
48 }
49 }while (c!=0);

51
52 }
```

Compiler Resources Compile Log Debug Find Results

Line: 45 Col: 62 Sel: 0 Lines: 55 Length: 1160 Insert Done parsing in 0.015 seconds

Type here to search

Output:

Select E:\DEVcpp files\17 march\q5\Project11.exe

enter two numbers : 73 13

quotient : 5

remainder :8

enter choice

1: add

2: subtract

3: multiply

4: integer divide

5:decimal division

press 0 to quit

5

enter two numbers : 75.7 6.2

result : 12.2097

enter choice

1: add

2: subtract

3: multiply

4: integer divide

5:decimal division

press 0 to quit

0

quitting

>Select E:\DEVcpp files\17 march\q5\Project11.exe

difference : -78.11

enter choice

1: add

2: subtract

3: multiply

4: integer divide

5:decimal division

press 0 to quit

3

enter two numbers : -5.89 -9.87

product : 58.1343

enter choice

1: add

2: subtract

3: multiply

4: integer divide

5:decimal division

press 0 to quit

4

enter two numbers : 73 13

quotient : 5

remainder :8

Select E:\DEVcpp files\17 march\q5\Project11.exe

```
enter choice  
1: add  
2: subtract  
3: multiply  
4: integer divide  
5:decimal division  
press 0 to quit
```

1

```
enter two numbers : 11.11 45.34
```

```
sum : 56.45
```

```
enter choice  
1: add  
2: subtract  
3: multiply  
4: integer divide  
5:decimal division  
press 0 to quit
```

2

```
enter two numbers : 7.78 85.89
```

```
difference : -78.11
```

```
enter choice  
1: add
```

█ Select E:\DEVcpp files\17 march\q5\Project11.exe

5:decimal division

press 0 to quit

5

enter two numbers : 75.7 6.2

result : 12.2097

enter choice

1: add

2: subtract

3: multiply

4: integer divide

5:decimal division

press 0 to quit

0

quitting

Process exited after 60.23 seconds with return value 0
Press any key to continue . . . ■

6. Write a C++ program to illustrate the usage of Nested classes.

“main.cpp”

```
#include<iostream>
using namespace std;
#include"outer.h"
typedef out::in inout;

void infriend(out::in& I);
void outfriend(out& O);

int main()
{
    inout inobj;
    out outobj;
    outfriend(outobj);
    infriend(inobj);

    int x1=inobj.getx(outobj);cout<<x1;
    int i1=inobj.geti();cout<<i1;
    int x2=outobj.getx();cout<<x2;
```

```
    return 0;  
}
```

“outer.h”

```
#ifndef OUT_H
#define OUT_H

class out{
    friend void outfriend(out&);

public:
    class in
    {
        friend void infriend(in&);

        public:
            int getx(out&);

            int geti();

    private:
        int i;

    };

    int getx();

};

private:
    int x;
```

```
};  
#endif
```

“outer.cpp”

```
#include "outer.h"  
  
#include<iostream>  
using namespace std;  
  
void infriend(out::in& I)  
{  
  
    cout<<"\n\n\n\n we are inside friend of inner class \n";  
    cout<<"\n\nenter value of i in inner class of object I\n ";cin>>I.i;  
  
}  
  
void outfriend(out& O)  
{  
  
    cout<<"\n\n\n\n we are inside friend of outer class \n";  
    cout<<"\n\n enter value of x in outer class of object O\n ";cin>>O.x;  
}
```

```
int out::in::getx(out& O)
{
    cout<<"\n\n\n\n we have defined a member function of inner class \n";
    cout<<"\n\n we can access x of outer class through inner class : ";

    return O.x;
};

int out::in::geti()
{
    cout<<"\n\n\n\n we have defined another member function of inner class \n";
    cout<<"\n\n we can access i of inner class through this : ";

    return i;
};

int out::getx()
{
    cout<<"\n\n\n\n we have defined member function of outer class \n";
    cout<<"\n\n we can access x of outer class through this : ";

    return x;
};
```

Project14 - [nested_class.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug main.cpp outer.h outer.cpp

```
10 }
11 }
12 }
13 }
14 void outfriend(out& O)
15 {
16     cout<<"\n\n\n\n we are inside friend of outer class \n";
17     cout<<"\n\n enter value of x in outer class of object O\n ";cin>>O.x;
18 }
19 }

20 int out::in::getx(out& O)
21 {
22     cout<<"\n\n\n\n we have defined a member function of inner class \n";
23     cout<<"\n\n we can access x of outer class through inner class : ";
24
25     return O.x;
26 }
27 int out::in::geti()
28 {
29     cout<<"\n\n\n\n we have defined another member function of inner class ";
30     cout<<"\n\n we can access i of inner class through this : ";
31
32     return i;
33 }
34 int out::getx()
35 {
36     cout<<"\n\n\n\n we have defined member function of outer class \n";
37     cout<<"\n\n we can access x of outer class through this : ";
38
39     return x;
40 }
41
42
43 }
```

Compiler Resources Compile Log Debug Find Results

Line: 8 Col: 22 Sel: 0 Lines: 45 Length: 984 Insert Done parsing in 0.031 seconds

Type here to search

Project14 - [nested_class.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug main.cpp outer.h outer.cpp

```
1 #include "outer.h"
2 #include<iostream>
3 using namespace std;
4
5 void infriend(out::in& I)
6 {
7
8     cout<<"\n\n\n\n\n we are inside friend of inner class \n";
9     cout<<"\n\n enter value of i in inner class of object I\n";cin>>I.i;
10
11 }
12
13
14 void outfriend(out& O)
15 {
16
17     cout<<"\n\n\n\n\n we are inside friend of outer class \n";
18     cout<<"\n\n enter value of x in outer class of object O\n";cin>>O.x;
19
20
21 int out::in::getx(out& O)
22 {
23
24     cout<<"\n\n\n\n\n we have defined a member function of inner class \n";
25     cout<<"\n\n we can access x of outer class through inner class : ";
26
27     return O.x;
28 }
29 int out::in::geti()
30 {
31
32     cout<<"\n\n\n\n\n we have defined another member function of inner class \n";
33     cout<<"\n\n we can access i of inner class through this : ";
34
35 }
```

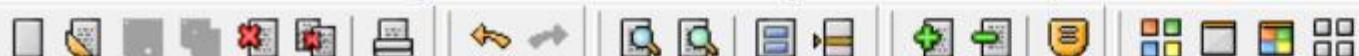
Compiler Resources Compile Log Debug Find Results

Line: 8 Col: 22 Sel: 0 Lines: 45 Length: 984 Insert Done parsing in 0.031 seconds

Type here to search

Project14 - [nested_class.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

Project14
main.cpp
outer.h
outer.cpp

main.cpp outer.h outer.cpp

```
1 ifndef OUT_H
2 define OUT_H
3
4
5
6 class out{
7     friend void outfriend(out&);
8     public:
9         class in
10    {
11        friend void infriend(in&);
12
13        public:
14            int getx(out&);
15            int geti();
16
17        private:
18            int i;
19    };
20    int getx();
21
22    private:
23        int x;
24
25
26};
27#endif
```

Compiler

Resources

Compile Log

Debug

Find Results

Line: 20

Col: 20

Sel: 0

Lines: 27

Length: 314

Insert

Project14 - [nested_class.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

Project14
main.cpp
outer.h
outer.cpp

main.cpp outer.h outer.cpp

```
1 #ifndef OUT_H
2 #define OUT_H
3
4
5
6 class out{
7     friend void outfriend(out&);
8 public:
9     class in
10    {
11         friend void infriend(in&);
12
13     public:
14         int getx(out&);
15         int geti();
16 }
```

Compiler Resources Compile Log Debug Find Results Close

Abort Compilation

Shorten compiler paths

```
-----
- Filename: E:\DEVcpp files\17 march\q6\Makefile.

Processing makefile...
-----
- Makefile Processor: C:\Program Files (x86)\Dev-
- Command: mingw32-make.exe -f "E:\DEVcpp files\1

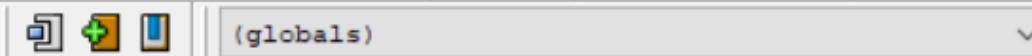
g++.exe -c outer.cpp -o outer.o -I"C:/Program Fil
g++.exe main.o outer.o -o nested_class.exe -L"C://"

Compilation results...
-----
- Errors: 0
- Warnings: 0
- Output Filename: E:\DEVcpp files\17 march\q6\nes
- Output Size: 1.85440158843994 MiB
- Compilation Time: 2.42s
```

< Line: 20 Col: 20 Sel: 0 Lines: 27 Length: 314 Insert

Project14 - [nested_class.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help



(globals)

Project Classes Debug

Project14
main.cpp
outer.h
outer.cpp

main.cpp outer.h outer.cpp

```
1 #include<iostream>
2 using namespace std;
3 #include"outer.h"
4 typedef out::in inout;
5
6 void infriend(out::in& I);
7 void outfriend(out& O);
8
9
10
11 int main()
12 {
13     inout inobj;
14     out outobj;
15     outfriend(outobj);
16     infriend(inobj);
17
18     int x1=inobj.getx(outobj);cout<<x1;
19     int i1=inobj.geti();cout<<i1;
20     int x2=outobj.getx();cout<<x2;
21
22
23
24     return 0;
25 }
```

Compiler Resources Compile Log Debug Find Results

Line: 11

Col: 10

Sel: 0

Lines: 25

Length: 363

Insert

Done



Type here to search



E:\DEVcpp files\17 march\q6\nested_class.exe

we are inside friend of outer class

enter value of x in outer class of object 0
3

we are inside friend of inner class

enter value of i in inner class of object I
5

we have defined a member function of inner class

we can access x of outer class through inner class : 3

we have defined another member function of inner class

we can access i of inner class through this : 5

we have defined member function of outer class

we can access x of of class through this : 3

Process exited after 5.02 seconds with return value 0
Press any key to continue . . . ■

7. Write a C++ program to illustrate the usage of Nested namespaces, Inline namespaces and using Directives.

“header1.h”

```
namespace outer
{
    void outermsg()
    {
        cout<<"\n\n    we are at outer namespace";
    }

    namespace middle
    {
        void middlemsg()
        {
            cout<<" \n\n    we are in middle namespace ";
        }
    }

    inline namespace inner
    {
        void innermsg()
        {
            cout<<"\n\n    we are inside inlined inner namespace";
        }
    }
}
```

```
 }  
 }
```

“main.cpp”

```
#include <iostream>  
  
using namespace std;  
  
#include "header1.h"  
  
  
int main()  
{  
  
    cout<<"\n\n\n\n outer::outermsg()";outer::outermsg();  
  
    cout<<"\n\n\n\n outer::middle::middlemsg()";outer::middle::middlemsg();  
  
    cout<<"\n\n\n\n outer::middle::inner::innermsg()";outer::middle::inner::innermsg();  
  
    cout<<"\n\n\n\n outer::middle::innermsg()";outer::middle::innermsg();  
  
    cout<<"\n\n\n\n aliasing ,namespace in = outer::middle::inner "; namespace in =  
outer::middle::inner;  
  
    cout<<"\n\n\n\n using namespace in";using namespace in;  
  
    cout<<"\n\n\n\n innermsg()";innermsg();  
  
    cout<<"\n\n\n\n aliasing, namespace mid=outer::middle";namespace mid=outer::middle;  
  
    cout<<"\n\n\n\n using namespace mid";using namespace mid;  
  
    cout<<"\n\n\n\n middlemsg()";middlemsg();  
  
    cout<<"\n\n\n\n innermsg()";innermsg();  
  
  
    return 0;  
}
```

Code screenshot:

Project15 - [Project15.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug main.cpp header1.h

```
1  namespace outer
2  {
3      void outermsg()
4      {
5          cout<<"\n\n      we are at outer namespace";
6      }
7      namespace middle
8      {
9          void middlemsg()
10         {
11             cout<< " \n\n      we are in middle namespace ";
12         }
13         inline namespace inner
14         {
15             void innermsg()
16             {
17                 cout<<"\n\n      we are inside inlined inner namespace";
18             }
19         }
20     }
21 }
22 }
```

Compiler Resources Compile Log Debug Find Results

Line: 22 Col: 2 Sel: 0 Lines: 22 Length: 411 Insert Done parsing in 0.032 seconds

Type here to search

Project15 - [Project15.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

Project Classes Debug main.cpp header1.h

```
1
2 namespace outer
3 {
4     void outermsg()
5     {
6         cout<<"\n\n      we are at outer namespace";
7     }
8     namespace middle
9     {
10        void middlemsg()
11        {
12            cout<<" \n\n      we are in middle namespace";
13        }
14    inline namespace inner
```

Compiler Resources Compile Log Debug Find Results Close

Abort Compilation

Shorten compiler paths

```
- Filename: E:\DEVcpp files\17 march\q7\Makefile.win
Processing makefile...
-----
- Makefile Processor: C:\Program Files (x86)\Dev-Cpp\MinGW64\bin\mingw32-make.exe
- Command: mingw32-make.exe -f "E:\DEVcpp files\17 march\q7\Makefile.win" clean

rm.exe -f main.o Project15.exe
g++.exe -c main.cpp -o main.o -I"C:/Program Files (x86)/Dev-Cpp/MinGW64/include"
g++.exe main.o -o Project15.exe -L"C:/Program Files (x86)/Dev-Cpp/MinGW64/lib" -

Compilation results...
-----
- Errors: 0
- Warnings: 0
- Output Filename: E:\DEVcpp files\17 march\q7\Project15.exe
- Output Size: 1.84351825714111 MiB
- Compilation Time: 2.16s
```

Line: 22 Col: 2 Sel: 0 Lines: 22 Length: 411 Insert Done parsing in 0.032 seconds

Type here to search

Project15 - [Project15.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

Project15

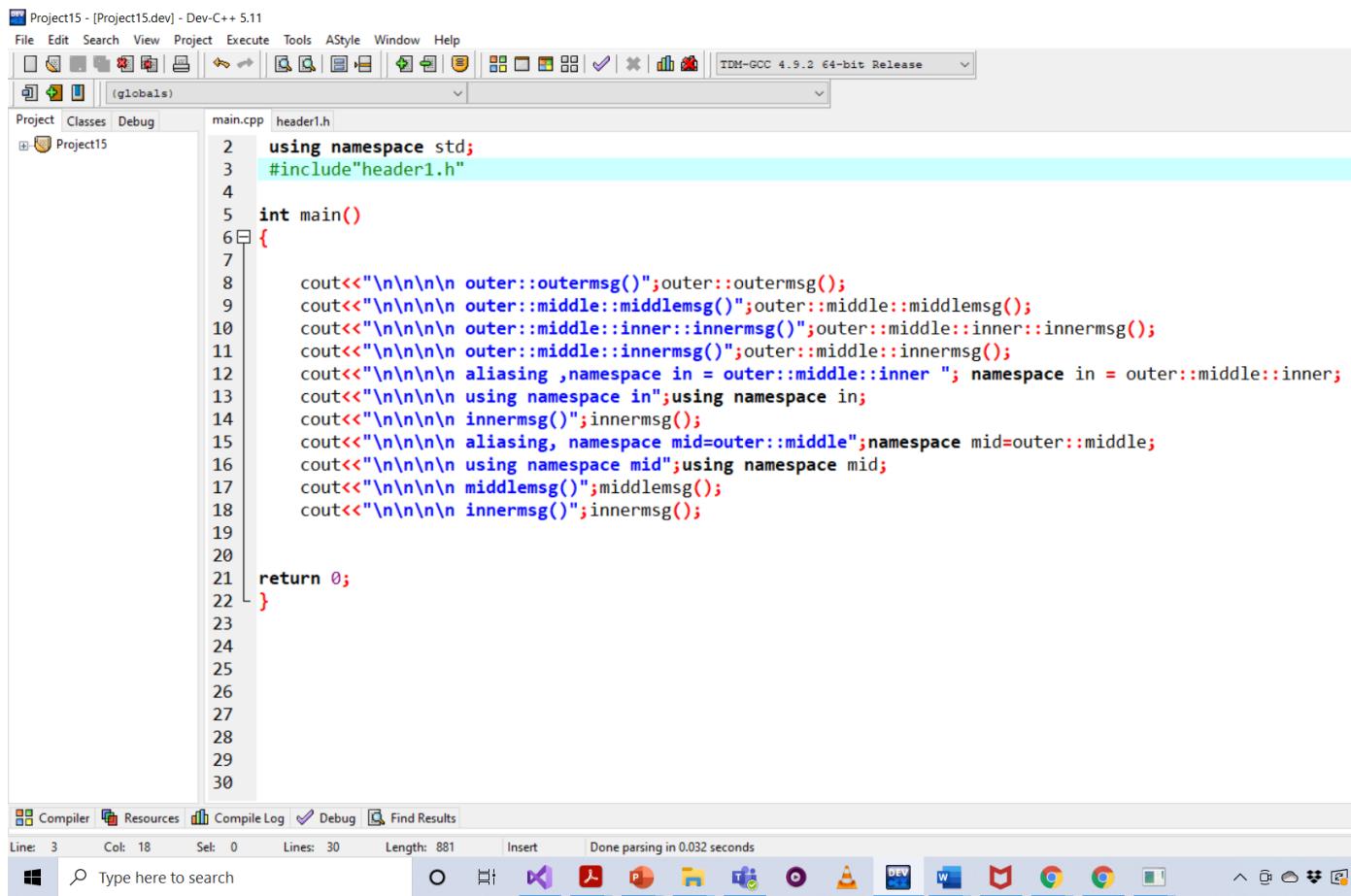
main.cpp header1.h

```
2 using namespace std;
3 #include "header1.h"
4
5 int main()
6 {
7     cout<<"\n\n\n\n outer::outermsg()";outer::outermsg();
8     cout<<"\n\n\n\n outer::middle::middlemsg()";outer::middle::middlemsg();
9     cout<<"\n\n\n\n outer::middle::inner::innermsg()";outer::middle::inner::innermsg();
10    cout<<"\n\n\n\n outer::middle::innermsg()";outer::middle::innermsg();
11    cout<<"\n\n\n\n aliasing ,namespace in = outer::middle::inner "; namespace in = outer::middle::inner;
12    cout<<"\n\n\n\n using namespace in";using namespace in;
13    cout<<"\n\n\n\n innermsg()";innermsg();
14    cout<<"\n\n\n\n aliasing ,namespace mid=outer::middle";namespace mid=outer::middle;
15    cout<<"\n\n\n\n using namespace mid";using namespace mid;
16    cout<<"\n\n\n\n middlemsg()";middlemsg();
17    cout<<"\n\n\n\n innermsg()";innermsg();
18
19
20
21 return 0;
22 }
```

Compiler Resources Compile Log Debug Find Results

Line: 3 Col: 18 Sel: 0 Lines: 30 Length: 881 Insert Done parsing in 0.032 seconds

Type here to search

A screenshot of the Dev-C++ IDE interface. The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar contains various icons for file operations like Open, Save, Print, and Build. The status bar at the bottom shows the current line (3), column (18), selected text (0), total lines (30), and length (881). It also indicates that the code was parsed in 0.032 seconds. The main code editor window displays C++ code demonstrating nested namespaces and aliasing. The code uses `cout` statements to print messages from different scopes. The code editor has tabs for main.cpp and header1.h. Below the code editor is a toolbar with icons for Compiler, Resources, Compile Log, Debug, and Find Results. The status bar also shows the current line (3), column (18), selected text (0), total lines (30), and length (881). The bottom of the screen shows the Windows taskbar with icons for File Explorer, Task View, Start, Taskbar settings, and several pinned application icons.

Output screenshot:

E:\DEVcpp files\17 march\q7\Project15.exe

```
outer::outermsg()
```

```
    we are at outer namespace
```

```
outer::middle::middlemsg()
```

```
    we are in middle namespace
```

```
outer::middle::inner::innermsg()
```

```
    we are inside inlined inner namespace
```

```
outer::middle::innermsg()
```

```
    we are inside inlined inner namespace
```

```
aliasing ,namespace in = outer::middle::inner
```

```
using namespace in
```

```
innermsg()
```

```
    we are inside inlined inner namespace
```

```
aliasing, namespace mid=outer::middle
```

```
using namespace mid
```

E:\DEVcpp files\17 march\q7\Project15.exe

```
outer::middle::innermsg()
```

```
we are inside inlined inner namespace
```

```
aliasing ,namespace in = outer::middle::inner
```

```
using namespace in
```

```
innermsg()
```

```
we are inside inlined inner namespace
```

```
aliasing, namespace mid=outer::middle
```

```
using namespace mid
```

```
middlemsg()
```

```
we are in middle namespace
```

```
innermsg()
```

```
we are inside inlined inner namespace
```

```
-----  
Process exited after 9.274 seconds with return value 0  
Press any key to continue . . .
```

