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Roll Number: SYCOC303 Division: C

PRN Number: 122B2B303 Batch: C4

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Problem Statement:

Implement a class Complex which represents the Complex Number data type. Implement the following operations:

a. Constructor (including a default constructor which creates the complex number (0+0i).

b. Overloaded operator + to add two complex numbers.

c. Overloaded operator * to multiply two complex numbers.

d. Overloaded << and >> to print and read Complex Numbers.

Write a C + + program to read and display all project information using Operator Overloading.

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INPUT:

```
/*
 *     ====================================
 *            Program Name: ComplexNumbers.cpp
 *     Created on: December 02, 2022
 *       Author: Vinayak Shete
 *  ====================================
 */

#include <iostream>
using namespace std;

class ComplexNumbers
{
    int real,img;
```

```
    public:
        ComplexNumbers()
        {
            this->real=0;
            this->img=0;
        }
        //overloading insertion operator
       friend istream &operator>>( istream  &input,ComplexNumbers &obj1)
       {
         input >> obj1.real >> obj1.img;
         return input;
       }
        //overloading ectraction operator
       friend ostream &operator<<( ostream  &output,ComplexNumbers &obj1)
       {
         output<<obj1.real<<" + i"<<obj1.img;
         return output;
       }
       //overloading addition + operator
       ComplexNumbers operator+(ComplexNumbers &obj)
       {
           ComplexNumbers cn;
           cn.real=this->real+obj.real;
           cn.img=this->img+obj.img;
           return cn;
       }
       //overloading multiplication * operator
       ComplexNumbers operator*(ComplexNumbers &obj)
       {
           ComplexNumbers cn;
           cn.real=this->real*obj.real;
           cn.img=this->img*obj.img;
           return cn;
       }
};

int main()
```

```
{
    ComplexNumbers c1,c2,c3,addresult,mulresult;
    cout<<"\n======Welcome===========";
    cout<<"\nThe Complex Numbers are-->";
    //default values are set using Constructor
    cout<<"\nFirst Number= "<<c1;
    cout<<"\nSecond Number= "<<c2;
    cout<<"\n======================================";
    cout<<"\nEnter the values for first complex number-->";
    cout<<"\nEnter real value and imaginary value:";
    cin>>c1;
    cout<<"\nThe values for first complex number are assigned by overloading insertion
operator!";
    cout<<"\nSecond Number==>The Complex number is: "<<c1;
    cout<<"\n======================================";
    cout<<"\nEnter the values for second complex number-->";
    cout<<"\nEnter real value and imaginary value:";
    cin>>c2;
    cout<<"\nThe values for second complex number are assigned by overloading
insertion operator!";
   //displaying values by overloading extraction operator
    cout<<"\nSecond Number==>The Complex number is: "<<c2;
    cout<<"\n======================================";
    cout<<"\n=====ADDITION OPERATION=====";
    cout<<"\nFirst Number= "<<c1;
    cout<<"\nSecond Number= "<<c2;
    addresult=c1+c2;
    cout<<"\nAddition of first and second Complex Number is= "<<addresult;
    cout<<"\n======================================";
    cout<<"\n======================================";
    cout<<"\n=====MULTIPLIATION OPERATION=====";
    cout<<"\nFirst Number= "<<c1;
    cout<<"\nSecond Number= "<<c2;
    mulresult=c1*c2;
    cout<<"\nMultiplication of first and second Complex Number is= "<<mulresult;
    cout<<"\n======================================";
    cout<<"\n======Thank You!===========";
```

```
    return 0;
}
```

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OUTPUT:

```
======Welcome===========
The Complex Numbers are-->
First Number= 0 + i0
Second Number= 0 + i0
====================================
Enter the values for first complex number-->
Enter real value and imaginary value:15 3

The values for first complex number are assigned by overloading insertion operator!
Second Number==>The Complex number is: 15 + i3
====================================
Enter the values for second complex number-->
Enter real value and imaginary value:12 6

The values for second complex number are assigned by overloading insertion operator!
Second Number==>The Complex number is: 12 + i6
====================================
=====ADDITION OPERATION=====
First Number= 15 + i3
Second Number= 12 + i6
Addition of first and second Complex Number is= 27 + i9
====================================
====================================
=====MULTIPLIATION OPERATION=====
First Number= 15 + i3
Second Number= 12 + i6
Multiplication of first and second Complex Number is= 180 + i18
====================================
======Thank You!===========
--------------------------------
Process exited after 14.45 seconds with return value 0
Press any key to continue . . .
```

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