

OOP Assignment - 04

Designing of Complex Number calculator

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PROBLEM STATEMENT: Implement a class Complex which represents the Complex Number.

Implement the following functions Using Operator Overloading:

1. Constructors (Include all constructor types)
2. Overload operator + to add two complex numbers using member function
3. Overload operator * to multiply two complex numbers using friend function
4. Overload operators << and >> to output and accept Complex Numbers

Code

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

class complex
{
    int x, y;

public:

    complex operator+(complex);
    friend complex operator*(complex, complex);

    // function prototype
    friend istream& operator>>(istream&, complex&);
    friend ostream& operator<<(ostream&, const complex&);
};

complex complex::operator+(complex c)
{
    complex temp;
    temp.x = x + c.x;
    temp.y = y + c.y;
    return temp;
}
```

```
}
```

```
complex operator*(complex a, complex b)
```

```
{  
    complex temp;  
    temp.x = a.x * b.x - a.y * b.y;  
    temp.y = a.x * b.y + a.y * b.x;  
    return temp;  
}
```

```
// function definition
```

```
istream& operator>>(istream& in, complex& c)
```

```
{  
    cout << "Enter real part: ";  
    in >> c.x;    // in for overloading  
    cout << "Enter imaginary part: ";  
    in >> c.y;    // in for overloading  
    return in;  
}
```

```
ostream& operator<<(ostream& out, const complex& c)
```

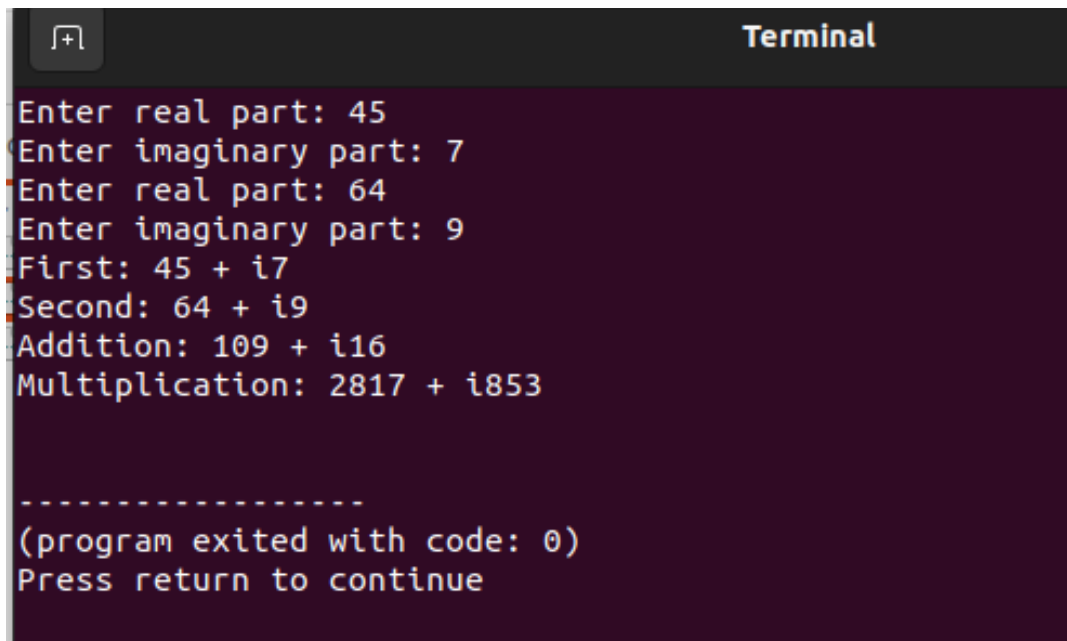
```
{  
    out << c.x << " + i" << c.y;    // out for overloading  
    return out;  
}
```

```
int main()
```

```
{  
    complex c1, c2, c3, c4;  
    // function call  
    cin >> c1;  
    cin >> c2;  
  
    cout << "First: " << c1 << endl;  
    cout << "Second: " << c2 << endl;  
  
    c3 = c1 + c2;  
    cout << "Addition: " << c3 << endl;
```

```
c4 = c1 * c2;  
cout << "Multiplication: " << c4 << endl;  
  
return 0;  
}
```

OUTPUT

A terminal window with a dark background and a title bar that says "Terminal". The window contains the following text:

```
Enter real part: 45  
Enter imaginary part: 7  
Enter real part: 64  
Enter imaginary part: 9  
First: 45 + i7  
Second: 64 + i9  
Addition: 109 + i16  
Multiplication: 2817 + i853  
  
-----  
(program exited with code: 0)  
Press return to continue
```