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**Class:-SY-2**

**PRN:-B25CE2015**

**Title:** **Designing of Complex Number calculator**

**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

**INPUT:**

#include <iostream>

using namespace std;

class Complex {

private:

float real; // real part

float imag; // imaginary part

public:

// Default constructor

Complex() {

real = 0;

imag = 0;

}

// Parameterized constructor

Complex(float r, float i) {

real = r;

imag = i;

}

// Copy constructor

Complex(const Complex &c) {

real = c.real;

imag = c.imag;

}

// Add two complex numbers (member function)

Complex operator+(Complex c) {

Complex temp;

temp.real = real + c.real;

temp.imag = imag + c.imag;

return temp;

}

// Multiply two complex numbers (friend function)

friend Complex operator\*(Complex c1, Complex c2);

// Input and output operator overloading

friend istream& operator>>(istream &in, Complex &c);

friend ostream& operator<<(ostream &out, Complex c);

};

// Multiplication of two complex numbers

Complex operator\*(Complex c1, Complex c2) {

Complex temp;

temp.real = (c1.real \* c2.real) - (c1.imag \* c2.imag);

temp.imag = (c1.real \* c2.imag) + (c1.imag \* c2.real);

return temp;

}

// Input complex number

istream& operator>>(istream &in, Complex &c) {

cout << "Enter real part: ";

in >> c.real;

cout << "Enter imaginary part: ";

in >> c.imag;

return in;

}

// Output complex number

ostream& operator<<(ostream &out, Complex c) {

out << c.real << " + " << c.imag << "i";

return out;

}

int main() {

Complex c1, c2, sum, product;

cout << "Enter first complex number:\n";

cin >> c1;

cout << "Enter second complex number:\n";

cin >> c2;

sum = c1 + c2; // add

product = c1 \* c2; // multiply

cout << "\nFirst Complex Number : " << c1 << endl;

cout << "Second Complex Number: " << c2 << endl;

cout << "Sum : " << sum << endl;

cout << "Product : " << product << endl;

return 0;

}

**OUTPUT:**

Enter first complex number:

Enter real part: 3

Enter imaginary part: 2

Enter second complex number:

Enter real part: 1

Enter imaginary part: 4

First Complex Number : 3 + 2i

Second Complex Number: 1 + 4i

Sum : 4 + 6i

Product : -5 + 14i