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OOP LAB ASSIGNMENTS(PRACTICALS)

PROBLEM STATEMENT:

Implement a class Complex which represents the Complex Number data type. Implement the following 1. Constructor (including a default constructor which creates the complex number 0+0i). 2. Overload operator+ to add two complex numbers. 3. Overload operator* to multiply two complex numbers. 4. Overload operators << and >> to print and read Complex Number

PROGRAM/SOURCE CODE:

```
#include <iostream>


class Complex

{

private:

   double real;

   double imag;


public:

   // Constructors

   Complex() : real(0.0), imag(0.0) {}

   Complex(double real, double imag) : real(real), imag(imag) {}


   // Overload operator+ to add two complex numbers

   Complex operator+(const Complex &other) const

   {

      return Complex(real + other.real, imag + other.imag);

   }


   // Overload operator* to multiply two complex numbers

   Complex operator*(const Complex &other) const

   {

      double result_real = real * other.real - imag * other.imag;

      double result_imag = real * other.imag + imag * other.real;
```

```
        return Complex(result_real, result_imag);
    }

    // Overload the << operator to print Complex Numbers
    friend std::ostream &operator<<(std::ostream &os, const Complex &complex)
    {
        os << complex.real;
        if (complex.imag >= 0)
        {
            os << " + " << complex.imag << "i";
        }
        else
        {
            os << " - " << -complex.imag << "i";
        }
        return os;
    }

    // Overload the >> operator to read Complex Numbers
    friend std::istream &operator>>(std::istream &is, Complex &complex)
    {
        std::cout << "Enter real part: ";
        is >> complex.real;
        std::cout << "Enter imaginary part: ";
        is >> complex.imag;
        return is;
    }
};

int main()
```

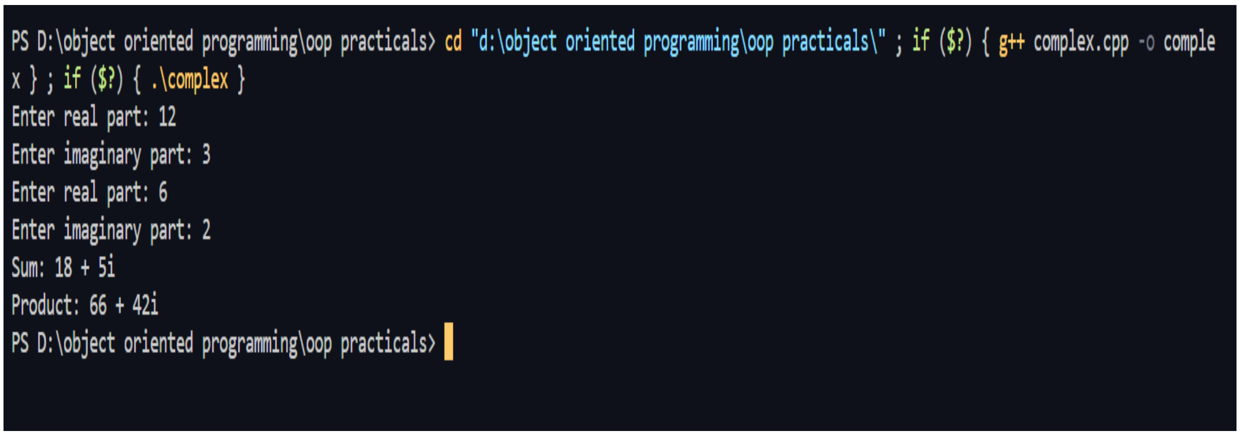
```
{
    Complex c1, c2;
    std::cin >> c1;
    std::cin >> c2;

    Complex sum = c1 + c2;
    Complex product = c1 * c2;

    std::cout << "Sum: " << sum << std::endl;
    std::cout << "Product: " << product << std::endl;

    return 0;
}
```

OUTPUT:



```
PS D:\object oriented programming\oop practicals> cd "d:\object oriented programming\oop practicals\" ; if ($?) { g++ complex.cpp -o comple
x } ; if ($?) { .\complex }
Enter real part: 12
Enter imaginary part: 3
Enter real part: 6
Enter imaginary part: 2
Sum: 18 + 5i
Product: 66 + 42i
PS D:\object oriented programming\oop practicals>
```