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Problem Statement:

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

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

2. Overloaded operator+ to add two complex numbers.

3. Overloaded operator* to multiply two complex numbers.

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

Program:

```
#include <iostream>

class Complex {

private:

   double real;

   double imag;

public:

    Complex(double r = 0, double i = 0) : real(r), imag(i) {}

    Complex operator+(const Complex& other) {

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

   }

   Complex operator*(const Complex& other) {

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

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

```
        return Complex(result_real, result_imag);
    }
        friend std::ostream& operator<<(std::ostream& os, const Complex& num) {
        os << num.real << "+" << num.imag << "i";
        return os;
    }
        friend std::istream& operator>>(std::istream& is, Complex& num) {
        is >> num.real >> num.imag;
        return is;
    }
};
int main() {
    Complex num1, num2;
    std::cout << "Enter the first complex number (e.g., 3 4): ";
    std::cin >> num1;
    std::cout << "Enter the second complex number (e.g., 1 2): ";
    std::cin >> num2;
    Complex sum = num1 + num2;
    Complex product = num1 * num2;
    std::cout << "Sum: " << sum << std::endl;
    std::cout << "Product: " << product << std::endl;
    return 0;
}
```

Output:

```
Enter the first complex number (e.g., 3 4): 3 4
Enter the second complex number (e.g., 1 2): 1 2
```

Sum: 4+6i

Product: -5+10i