**ASSIGNMENT NO:1**

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**Date:**

**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. Overloaded operator+ to add two complex numbers.

3. Overloaded operator\* to multiply two complex numbers.4. Overloaded << and >> to

print and read Complex Numbers.

**Code:**

#include <iostream>

using namespace std;

class complex // default constructor

{

float realp,imagp;

public:

complex() // access specifier

{

realp=0;

imagp=0;

}

complex operator+(complex &); // addition operator

complex operator\*(complex &); // multiplication operator

complex(float,float);

friend istream &operator>>(istream &,complex &);

friend ostream &operator<<(ostream &,complex &);

};

complex::complex(float x,float y)

{

realp=x;

imagp=y;

}

istream &operator>>(istream &din, complex &c)

{

cout<<"\n Enter the real part of complex number 2:";

din>>c.realp;

cout<<"\n Enter the imaginary part of complex number 2:";

din>>c.imagp;

return din;

}

// functions to display complex no's

ostream &operator<<(ostream &dout, complex &c)

{

dout<<c.realp<<"+"<<c.imagp<<"i";

dout<<endl;

return dout;

}

// function to add two complex no's

complex complex::operator+(complex &c)

{

complex temp;

temp.realp=realp + c.realp;

temp.imagp=imagp + c.imagp;

return temp;

}

//function to multiply two complex no's

complex complex::operator\*(complex &c)

{

complex mul;

mul.realp=(realp\*c.realp)+(imagp\*c.imagp);

mul.imagp=(imagp\*c.imagp)+(realp\*c.imagp);

return mul;

}

int main()

{

complex c2,c3;

complex c1(1.2,2.2);

cout<<"\n Enter Complex number 1:"<<c1;

cout<<"\n Enter Complex number 2:";

cin>>c2;

cout<<"\n Complex number 1 is:";

cout<<c1;

cout<<"\n Complex number 2 is:";

cout<<c2;

cout<<"\n Complex number 3 is:";

cout<<c3;

cout<<"\n Addition of two complex numbers:";

c3=c1+c2;

cout<<c3;

cout<<"\n Multiplication of two complex numbers:";

c3=c1\*c2;

cout<<c3; // display value of c3

return 0;

}

**Output :**

pllab0112@pllab0112-ThinkCentre-M70s:~$ g++ constructor.cpp

pllab0112@pllab0112-ThinkCentre-M70s:~$ ./a.out

Enter Complex number 1:1.2+2.2i

Enter Complex number 2:

Enter the real part of complex number 2:2

Enter the imaginary part of complex number 2:0.3

Complex number 1 is:1.2+2.2i

Complex number 2 is:2+0.3i

Complex number 3 is:0+0i

Addition of two complex numbers:3.2+2.5i

Multiplication of two complex numbers:3.06+1.02i

OR

#include <iostream>

using namespace std;

class Complex {

private:

double real;

double imag;

public:

Complex() { real = 0.0; imag = 0.0; } // Constructors

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

Complex operator+(const Complex& c) { // Overloaded operator+

Complex res;

res.real = real + c.real;

res.imag = imag + c.imag;

return res;

}

Complex operator\*(const Complex& c) { // Overloaded operator\*

Complex res;

res.real = real \* c.real - imag \* c.imag;

res.imag = real \* c.imag + imag \* c.real;

return res;

}

friend ostream& operator<<(ostream& out, const Complex& c) { // Overload stream operator <<

out << c.real;

if (c.imag > 0) {

out << "+";

}

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

return out;

}

friend istream& operator>>(istream& in, Complex& c) { // Overload stream operator >>

in >> c.real >> c.imag;

return in;

}

};

int main() {

Complex c1(2, 3), c2;

cin >> c2;

Complex c3 = c1 + c2;

cout << "Addition is: " << c3 << "\n";

Complex c4 = c1 \* c2;

cout << "Multiplication is: " << c4 << "\n";

return 0;

}