

Practical 4

Topic: Designing of Complex Number calculator

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Code:

```
// Implement a class Complex which represents the Complex Number.
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#include<iostream>
using namespace std;

class complex {
    float real,img;
public:
    complex() {
        real = 0;
        img = 0;
    }
    /*complex(float a, float b) {
        real = a;
        img = b;
    }*/
    void display() {
        cout << real << "+" << img << "i" << endl;
    }
};

// Function Prototype
complex operator+(complex);
friend complex operator*(complex, complex);
friend istream &operator >> (istream &, complex &);
friend ostream &operator << (ostream &, complex &);

// Function Definition
complex complex::operator+(complex c) {
    complex ob;
    ob.real = real + c.real;
    ob.img = img + c.img;
    return ob;
}

complex operator*(complex c1 , complex c2) {
    complex ob;
    ob.real= (c1.real * c2.real) - (c1.img * c2.img);
    ob.img =(c1.real * c2.img) + (c1.img * c2.real);
    return ob;
}

istream &operator >> (istream &in, complex &obj)
{
    cout << "Enter the real part: ";
    in >> obj.real;
    cout << "Enter the imaginary part: ";
    in >> obj.img;
    return in;
}

ostream &operator << (ostream &out, complex &obj)
```

```

{
    out << obj.real << "+";
    out << obj.img << "i";
    return out;
}
int main() {
    /*float a, b, c, d;
    cout << "Enter first complex number(real no. then imaginary no.): " << endl;
    cin >> a >> b;
    complex C1(a, b);
    cout << "C1 = ";
    C1.display();
    cout << "Enter second complex number(real no. then imaginary no.): " << endl;
    cin >> c >> d;
    complex C2(c, d);
    cout << "C2 = ";
    C2.display();*/
    complex C1, C2;
    cout << "Enter values for first Complex no.: \n";
    cin >> C1;
    cout << "Enter values for second Complex no.: \n";
    cin >> C2;
    int choice;
    do {
        cout << "Choose the operation:\n1. Addition\n2. Multiplication\n3.
Exit\n";
        cin >> choice;
        if (choice == 1) {
            complex C3 = C1 + C2;
            cout << "Addition = ";
            C3.display();
        } else if (choice == 2) {
            complex C4 = C1 * C2;
            cout << "Multiplication = ";
            C4.display();
        } else if (choice == 3) {
            cout << "Exiting program...\n";
        } else {
            cout << "Invalid choice! Please try again.\n";
        }
    } while (choice != 3);
    return 0;
}

```

Output:

```
Enter values for first Complex no.:
Enter the real part: 2
Enter the imaginary part: 3
Enter values for second Complex no.:
Enter the real part: 4
Enter the imaginary part: 1
Choose the operation:
1. Addition
2. Multiplication
3. Exit
1
Addition = 6+4i
Choose the operation:
1. Addition
2. Multiplication
3. Exit
2
Multiplication = 5+14i
Choose the operation:
1. Addition
2. Multiplication
3. Exit
3
Exiting program...
```