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**Batch - IT32**

**Lab Evaluation Assignment**

## Question:

Create a class called Complex in C++ for performing arithmetic with complex numbers. Use double variables to represent the private data of the class. Provide public member functions for each of the following:

- a) Enter the values a complex number.
- b) Subtraction of two Complex numbers.
- c) Multiplication of two Complex numbers.
- d) Printing Complex numbers in the form:  $a + b i$

## Solution:

```
#include<iostream>

#include<stdio.h>

using namespace std;

class Complex
{
    private:
        double real_part;
        double img_part;

    public:
        void set();
        Complex subtract(Complex,Complex);
        Complex multiply(Complex,Complex);
        void Print();
};

void Complex::set()
{
    double r,i;

    cin>>r>>i;

    real_part = r;
```

```

    img_part = i;
}

Complex Complex::subtract(Complex x,Complex y)
{
    Complex sum;

    sum.real_part = x.real_part - y.real_part;

    sum.img_part = x.img_part - y.img_part;

    return sum;
}

Complex Complex::multiply(Complex x,Complex y)
{
    Complex product;

    product.real_part = x.real_part * y.real_part + (x.img_part * y.img_part * -1);

    product.img_part = x.real_part * y.img_part + y.real_part * x.img_part;

    return product;
}

void Complex::Print()
{
    //cout<<"("<<real_part<<")"<<"+ "<<"("<<img_part<<"i"<<")"<<endl;

    if(img_part>0)

        cout<<real_part<<"+ "<<img_part<<"i"<<endl;

    else

        cout<<real_part<<img_part<<"i"<<endl;
}

int main()
{
    Complex c1,c2;

    cout<<"Enter real and imaginary parts of the 1st number"<<endl;

    c1.set();

    cout<<"Enter real and imaginary parts of the 2nd number"<<endl;

    c2.set();

    Complex difference=c1.subtract(c1,c2);

    Complex product=c1.multiply(c1,c2);

    cout<<"1st complex number: ";

    c1.Print();

    cout<<"2nd complex number: ";

    c2.Print();

    cout<<"Difference between 1st and 2nd numbers is: ";

```

```
difference.Print();

cout<<"Product of 1st and 2nd numbers is: ";

product.Print();

return 0;

}
```

## Outputs on the terminal:

```
Enter real and imaginary parts of the 1st number
3
2
Enter real and imaginary parts of the 2nd number
1
7
1st complex number: 3+2i
2nd complex number: 1+7i
Difference between 1st and 2nd numbers is: 2-5i
Product of 1st and 2nd numbers is: -11+23i

...Program finished with exit code 0
Press ENTER to exit console.█
```

```
Enter real and imaginary parts of the 1st number
10
5
Enter real and imaginary parts of the 2nd number
4
3
1st complex number: 10+5i
2nd complex number: 4+3i
Difference between 1st and 2nd numbers is: 6+2i
Product of 1st and 2nd numbers is: 25+50i

...Program finished with exit code 0
Press ENTER to exit console.█
```