

```
*/
```

```
package _1_Assignment_ClassesAndObject;  
import java.util.*;
```

```
class Complex {  
    private float real;  
    private float imaginary;  
  
    // Default constructor  
    public Complex() {  
        this.real = 0.0f;  
        this.imaginary = 0.0f;  
    }  
  
    // Parameterized constructor  
    public Complex(float real, float imaginary) {  
        this.real = real;  
        this.imaginary = imaginary;  
    }  
  
    // Getter methods  
    public float getReal() {  
        return real;  
    }  
  
    public float getImaginary() {  
        return imaginary;  
    }  
  
    // Setter methods  
    public void setReal(float real) {  
        this.real = real;  
    }  
  
    public void setImaginary(float imaginary) {  
        this.imaginary = imaginary;  
    }  
  
    // Method to add two complex numbers  
    public Complex add(Complex second) {  
        float resultReal = real + second.real;  
        float resultImaginary = imaginary + second.imaginary;  
        return new Complex(resultReal, resultImaginary);  
    }  
  
    // Method to subtract two complex numbers  
    public Complex subtract(Complex second) {  
        float resultReal = real - second.real;  
        float resultImaginary = imaginary - second.imaginary;
```

```

        return new Complex(resultReal, resultImaginary);
    }

    // Method to multiply two complex numbers
    public Complex multiply(Complex second) {
        float resultReal = real * second.real - imaginary * second.imaginary;
        float resultImaginary = real * second.imaginary + imaginary * second.real;
        return new Complex(resultReal, resultImaginary);
    }

    // Method to divide two complex numbers
    public Complex divide(Complex second) {
        float denominator = second.real * second.real + second.imaginary * second.imaginary;

        if (denominator == 0.0) {
            System.out.println("Error: Division by zero is not allowed.");
            return null; // Return null to indicate an error
        }

        float resultReal = (real * second.real + imaginary * second.imaginary) / denominator;
        float resultImaginary = (imaginary * second.real - real * second.imaginary) / denominator;
        return new Complex(resultReal, resultImaginary);
    }

    // Method to display the complex number
    public void display() {
        System.out.println(real + " + " + imaginary + "i");
    }
}

public class Complex_Number {
    public static void main(String args[]) {
        Scanner vk = new Scanner(System.in);
        boolean continueProgram = true;

        while (continueProgram) {
            System.out.println("Enter real part for complex number 1:");
            float real1 = vk.nextFloat();
            System.out.println("Enter Imaginary part for complex number 1:");
            float imaginary1 = vk.nextFloat();
            Complex complex1 = new Complex(real1, imaginary1);

            System.out.println("Enter real part for complex number 2:");
            float real2 = vk.nextFloat();
            System.out.println("Enter Imaginary part for complex number 2:");
            float imaginary2 = vk.nextFloat();
            Complex complex2 = new Complex(real2, imaginary2);

            System.out.println("Select operation:");
            System.out.println("1. Addition");
            System.out.println("2. Subtraction");
            System.out.println("3. Multiplication");
            System.out.println("4. Division");
            System.out.println("5. Exit");
            int choice = vk.nextInt();

```

```

Complex result = null;
switch (choice) {
    case 1:
        result = complex1.add(complex2);
        break;
    case 2:
        result = complex1.subtract(complex2);
        break;
    case 3:
        result = complex1.multiply(complex2);
        break;
    case 4:
        result = complex1.divide(complex2);
        break;
    case 5:
        continueProgram = false;
        break;
    default:
        System.out.println("Invalid choice.");
}

if (result != null) {
    System.out.print("Result: ");
    result.display();
} else if (choice != 5) {
    System.out.println("Division error occurred.");
}

System.out.println("Program exited.");
vk.close();
}
}

```