20124029
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Assignment

Program that randomly generates complex numbers and write two numbers per line in a file along with an operator(+,-,*,/) .The numbers are written to file in the format (a+ib):

```
import java.util.Random;
import java.io.*;

class Complex {
    private int real, imaginary;
    public String value;
    Complex(int real, int imaginary) {
        this.real = real;
        this.imaginary = imaginary;
        this.value = new String(String.valueOf(this.real) + "+" +
String.valueOf(this.imaginary) + "i");
    }

    public static Complex add(Complex complexNo1, Complex complexNo2) {
        return new Complex(complexNo1.real + complexNo2.real,
complexNo1.imaginary + complexNo2.imaginary);
    }

    public static Complex subtract(Complex complexNo1, Complex complexNo2) {
        return new Complex(complexNo1.real - complexNo2.real,
complexNo1.imaginary - complexNo2.imaginary);
    }

    public static Complex divide(Complex dividend, Complex divisor) {
        int a = dividend.real;
        int b = dividend.imaginary;
        int c = divisor.real;
        int d = divisor.imaginary;
        return new Complex((a * c + b * d) / (c * c + d * d), (b * c + a * d) /
(c * c + d * d));
    }

    public static Complex multiply(Complex complexNo1, Complex compelexNo2) {
        int a = complexNo1.real;
```

```
        int b = complexNo1.imaginary;
        int c = compelexNo2.real;
        int d = compelexNo2.imaginary;
        return new Complex(a * c - b * d, b * c + a * d);
    }

    public int getReal() {
        return this.real;
    }

    public int getImg() {
        return this.imaginary;
    }
}

public class Main {
    public static void main(String[] args) {
        Random rand = new Random();
        Complex c1 = new Complex(rand.nextInt(30), rand.nextInt(30));
        Complex c2 = new Complex(rand.nextInt(30), rand.nextInt(30));

        Complex sum = Complex.add(c1, c2);
        Complex diff = Complex.subtract(c1, c2);
        Complex prod = Complex.multiply(c1, c2);
        Complex quot = Complex.divide(c1, c2);

        try (FileWriter f = new FileWriter("complex.txt", true);
                BufferedWriter b = new BufferedWriter(f);
                PrintWriter p = new PrintWriter(b);) {
                    p.println("Numbers: " + c1.value + ", " + c2.value + "\n");
                    p.println("(" + c1.value + ")" + " + " + "(" + c2.value + ")"
+ " = " + sum.value);
                    p.println("(" + c1.value + ")" + " - " + "(" + c2.value + ")"
+ " = " + diff.value);
                    p.println("(" + c1.value + ")" + " * " + "(" + c2.value + ")"
+ " = " + prod.value);
                    p.println("(" + c1.value + ")" + " / " + "(" + c2.value + ")"
+ " = " + quot.value);
                }
        catch (IOException i) {
            i.printStackTrace();
        }

    }
}
```

Output File(complex.txt):

```
1   Numbers: 4+19i, 16+16i
2
3   (4+19i) + (16+16i) = 20+35i
4   (4+19i) - (16+16i) = -12+3i
5   (4+19i) * (16+16i) = -240+368i
6   (4+19i) / (16+16i) = 0+0i
```