**public class Complex {**

**double** real = 0.0000;

**double** img = 0.0000;

**double** mod = 0.0000; // modulus

**double** arg = 0.0000; // angle

// set data from main

**public** **void** setData(**double** real, **double** img) {

**this**.real = real;

**this**.img = img;

}

// method to calculate the modulus

**void** calcMod() {

mod = Math.*sqrt*(Math.*pow*(real, 2) + Math.*pow*(img, 2));

}

// method to calculate the argument

**void** calcArg() {

arg = Math.*atan*(img / real);

**if** (real > 0) {

**if** (img > 0) { // 1st quadrant

arg = arg \* 180 / Math.*PI*;

} **else** { // 4th quadrant

arg = 360 + arg \* 180 / Math.*PI*;

}

} **else** {

**if** (img > 0) { // 2nd quadrant

arg = 180 + arg \* 180 / Math.*PI*;

} **else** { // 3rd quadrant

arg = 180 + arg \* 180 / Math.*PI*;

}

}

}

**double** getMod() {

**return** mod;

}

**double** getArg() { //returns degrees

**return** arg;

}

}

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// This app calculates the phasor (polar) components of two complex numbers

// given their real and imaginary components (a + bi).

**public** **class** ComplexApp {

// formatter object

**static** NumberFormat *format1* = **new** DecimalFormat("#0.0000");

**public** **static** **void** main(String[] args) {

Scanner input1 = **new** Scanner(System.*in*);

// 1st number

Complex c1 = **new** Complex(); //create object from class Complex

System.*out*.println("Enter real component of 1st number: ");

**double** real1 = input1.nextDouble();

System.*out*.println("Enter imaginary component of 1st number: ");

**double** img1 = input1.nextDouble();

c1.setData(real1, img1); // invokes setter method to input data

// invoke method to calculate the modulus and argument

c1.calcMod();

c1.calcArg();

**double** modulus = c1.getMod();

System.*out*.println("Modulus = " + *format1*.format(modulus));

**double** argument = c1.getArg();

System.*out*.println("Argument (deg) = " +

*format1*.format(argument));

System.*out*.println("\n\*\*\*\*\*\*\*\*\*");

// 2nd number

Complex c2 = **new** Complex(); //create object from class Complex

System.*out*.println("Enter real component of 2nd number: ");

**double** real2 = input1.nextDouble();

System.*out*.println("Enter imaginary component of 2nd number: ");

**double** img2 = input1.nextDouble();

c2.setData(real2, img2); // invokes setter method to input data

// invoke method to calculate the modulus and argument

c2.calcMod();

c2.calcArg();

**double** modulus2 = c2.getMod();

System.*out*.println("Modulus = " + *format1*.format(modulus2));

**double** argument2 = c2.getArg();

System.*out*.println("Argument (deg) = " +

*format1*.format(argument2));

input1.close(); // close scanner

}

}

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**OUTPUT**

Enter real component of 1st number:

-3

Enter imaginary component of 1st number:

4

Modulus = 5.0000

Argument (deg) = 126.8699

\*\*\*\*\*\*\*\*\*

Enter real component of 2nd number:

3

Enter imaginary component of 2nd number:

-4

Modulus = 5.0000

Argument (deg) = 306.8699