CS23304 JAVA PROGRAMMING
Course Instructor: V P Jayachitra

Instruction:
- **Use meaningful variable names**
- **Consistent indentation**
- **Proper error handling**
- **Proper comment to follow the question requirement**

1 Complex Number

Write a program to create a ComplexNumber class with the following features:

- Two private double fields to represent the real and imaginary parts.
- A constructor to initialize the complex number.
- Getter methods for the real and imaginary parts.
- Methods to add, subtract, multiply, and divide complex numbers.
- An override of the toString() method to represent the complex number in the form "a + bi" OR "a -bi" OR "-a -bi" OR "-a +bi".
- An override of the equals() method to compare two complex numbers.
- write a main method to demonstrate the usage of this class.

Hint:
```
public ComplexNumber add(ComplexNumber other) {
     double newReal = this.real + other.real;
     double newImaginary = this.imaginary + other.imaginary;
     return new ComplexNumber(newReal, newImaginary);
  }
@Override
 public boolean equals(Object obj) { ..}
   @Override
   public String toString() { …}
```
Example:
Input:
```
ComplexNumber c1 = new ComplexNumber(3, 4);
ComplexNumber c2 = new ComplexNumber(1, -2);
System.out.println("c1: " + c1);
System.out.println("c2: " + c2);
ComplexNumber sum = c1.add(c2);
ComplexNumber difference = c1.subtract(c2);
ComplexNumber product = c1.multiply(c2);
ComplexNumber quotient = c1.divide(c2);
boolean isEqual = c1.equals(c2);
System.out.println("c1 equals c2: " + isEqual);
```
Output:
```
c1: 3.0 + 4.0i
c2: 1.0 + -2.0i
Sum: 4.0 + 2.0i
Difference: 2.0 + 6.0i
```

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Product: 11.0 + -2.0i
Quotient: -0.5 + 1.5i
c1 equals c2: false