

Rational Class

The idea is that a Rational object represents a rational number. Please recall that a rational number is a number that can be represented as the quotient of two integers. For example, all of the following are Rational numbers:

5/13, 20/17, 3/7, 7/3, 2/1, 1/2, 20/40, 2000/4000, etc.

1. Create a project called Lab16
2. Create a class called `Rational.java`.
3. Put in two instance variables for the “state”. Use an `int` variable called `num` for the numerator, and an `int` variable called `den` for the denominator.
4. Provide a constructor that allows the user to specify the numerator and denominator in that order:

```
public Rational(int numIn, int denIn)
```
5. Provide a `toString` method. For example, if the rational number is 15/5, then the return value should be the String “15/5”. (No spaces).
6. Provide an instance method called `reciprocal`, which returns the reciprocal of the rational number. For example, if the current object is 7/5, the return value will be a new rational number that represents 5/7.
7. Provide a **static** method called `multiply`, which takes **two** rational numbers as parameters and returns a new `Rational` number representing their product. **Do not reduce any fractions!**
8. Provide an **instance** method called `divide`, which takes **one** rational number as a parameter and returns a new `Rational` number representing the quotient obtained by dividing the current object by the parameter. For example, if `x` is 2/3 and `y` is 5/7 then `x.divide(y)` should yield 14/15. **Do not reduce any fractions!**
9. Provide an instance method called `add`, which takes one rational number as a parameter and returns a new `Rational` number representing the sum of the current object plus the parameter. You must use the following formula for computing the sum. **Do not reduce any fractions:**

The sum of a/b plus c/d is to be computed as:

$$(ad + cb) / (bd)$$

10. **Write a series of JUnit test cases to test out all of your code.**