

StudyQuestion-28.11.2014

Create a class called **Rational** which has two private instance variables for the **numerator** and the **denominator**. Your Rational class should satisfy the following properties:

1. It should have a constructor that initializes a Rational object when both numerator and denominator are provided. However, it should store the number in reduced form, that is, for the fraction $2/4$, it should store 1 as numerator and 2 as denominator since $2/4=1/2$ in reduced form.
2. Write a one argument constructor that will take an integer parameter for the numerator as input, in that case, it will store 1 as denominator.
3. Provide public methods that perform each of the following operations:
 - Implement **addRational** method which will take two Rational objects as input and it will return the result of the addition as a Rational.
 - Implement **subtractRational** method which will return the subtraction of two Rational numbers as a Rational.
 - Overwrite **toString()** method so that it will return the string representation of Rational number in the form a/b , where a is the numerator and b is the denominator.
4. Write a test class **RationalTest** that will perform the following:
 - create n number of Rational objects and put them in an ArrayList called **rationalList**. n will be a command line argument. Each of the created n objects will be in the following form: $1/2, 2/3, 3/4, 4/5, \dots, n/n+1$.
 - Print the difference between each consecutive Rational number using **toString()** method of Rational. Therefore, you should first call **subtractRational** then **toString** method. For instance, you should print $1/2-2/3, 2/3-3/4, \dots, (n-1/n)-(n/n+1)$. You should take numbers from the **rationalList**.
 - Print the addition of each consecutive Rational number using **toString()** method of Rational. For instance, you should print $1/2+2/3, 2/3+3/4, \dots, (n-1/n)+(n/n+1)$. You should take numbers from the **rationalList**.