

CSAP - Chap 6 – Funny Fraction

Develop a new class for representing Funny Fractions.

- A Funny Fraction has a numerator and denominator that are integers.
- A Funny Fraction can be instantiated with a default constructor or with a parameterized constructor
 - The default constructor initializes the numerator to 0 and the denominator to 1
 - The parameterized constructor checks that the parameter for the denominator is not 0. It sets the instance variable to 1 if the denominator parameter is 0.
- Accessors, `getNumerator()` and `getDenominator()`, return the instance variables, numerator and denominator.
- The four arithmetic functions are unique and do not make any sense mathematically. In the event that the denominator results in a zero, it should be changed to -1. There is no reducing in the world of Funny Fractions.
- Include a `toString()` method that returns a string of the form `<numerator>/<denominator>`.

The 4 arithmetic functions:

```
public FunnyFraction funnyAdd (FunnyFraction f)
```

$$\frac{n1}{d1} + \frac{n2}{d2} = \frac{n1+n2+d1+d2}{(n1+n2)(d1+d2)}$$

```
public FunnyFraction funnySubtract (FunnyFraction f)
```

$$\frac{n1}{d1} - \frac{n2}{d2} = \frac{d2-d1-n2-n1}{(d2-d1)(n2-n1)}$$

```
public FunnyFraction funnyMult(FunnyFraction f)
```

$$\frac{n1}{d1} \times \frac{n2}{d2} = \frac{\sqrt{(n1-n2)^2 + d1}}{(d1-d2)^2 - n2}$$

```
public FunnyFraction funnyDivide (FunnyFraction f)
```

$$\frac{n1}{d1} \div \frac{n2}{d2} = \frac{n1 \times d2}{d1 \times n2}$$

Test data:

```
FunnyFraction f1 = new FunnyFraction ( 3, 4);  
FunnyFraction f2 = new FunnyFraction ( 5, 6);  
System.out.println (f1.funnyAdd(f2));  
System.out.println (f1.funnySubtract(f2));  
System.out.println (f1.funnyMult(f2));  
System.out.println (f1.funnyDivide(f2));
```

Output:

18/80

-6/4

4/-1

18/20