Session 16: SCALA BASICS 3

Assignment 1

Task 1

Create a calculator to work with rational numbers.

Requirements:

- ➢ It should provide the capability to add, subtract, divide and multiply rational numbers
- ➢ Create a method to compute GCD (this will come in handy during operations on rational)

Add option to work with whole numbers which are also rational numbers i.e. (n/1)

- ➢ Achieve the above using auxiliary constructors
- ➢ Enable method overloading to enable each function to work with numbers and rational.

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Quick Access

helloWorld.scala ⊠

```scala
 5    class Rational(n: Int, d:Int) {
 6      private def gcd(x: Int, y: Int): Int = {
 7        if (x == 0) y
 8        else if (x < 0) gcd(-x, y)
 9        else if (y < 0) -gcd(x, -y)
10        else gcd(y % x, x);
11      }
12      private val g = gcd(n, d);
13      val numer: Int = n/g;
14      val denom: Int = d/g;
15      def this(n:Int)=this(n,1)
16      def +(that: Rational) =
17        new Rational(numer * that.denom + that.numer * denom,
18          denom * that.denom);
19      def +(i:Int):Rational=new Rational(numer + i*denom,denom)
20      def -(that: Rational) =
21        new Rational(numer * that.denom - that.numer * denom,
22          denom * that.denom);
23          def -(i:Int):Rational=new Rational(numer - i*denom,denom)
24      def *(that: Rational) =
25        new Rational(numer * that.numer, denom * that.denom);
26            def *(i:Int):Rational=new Rational(numer * i,denom)
27      def /(that: Rational) =
28        new Rational(numer * that.denom, denom * that.numer);
29                def /(i:Int):Rational=new Rational(numer, i*denom)
30
31      override def toString = numer + "/" + denom
32    }
33    var n = new Rational(1,3)
34    var  d = new Rational(3,2)
35    var add = n.+(d) ;  println("Addition of two rational numbers "+add);
36    var sub = n.-(d); println("Subtraction of two rational numbers "+ sub);
37    var mul=n.*(d);println("Multiplication of two rational numbers "+mul);
38    val div= n./(d);println("Division of two rational numbers "+div);
39    println("Addition of rational Number with integar",n + 2)
40    println("Subtraction of rational Number with integar",n - 1)
41      println("Multiplication of rational Number with integar",d * 2)
42        println("Division of rational Number with integar",d / 2)
43
```

Console ⊠

```
<terminated> helloWorld$ [Scala Application] /usr/java/jdk1.8.0_151/bin/java (Oct 13, 2018, 5:35:11 PM)
Addition of two rational numbers 11/6
Subtraction of two rational numbers -7/6
Multiplication of two rational numbers 1/2
Division of two rational numbers 2/9
(Addition of rational Number with integar,7/3)
(Subtraction of rational Number with integar,-2/3)
(Multiplication of rational Number with integar,3/1)
(Division of rational Number with integar,3/4)
```

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