

Session 16: SCALA BASICS 2 : Assignment 1

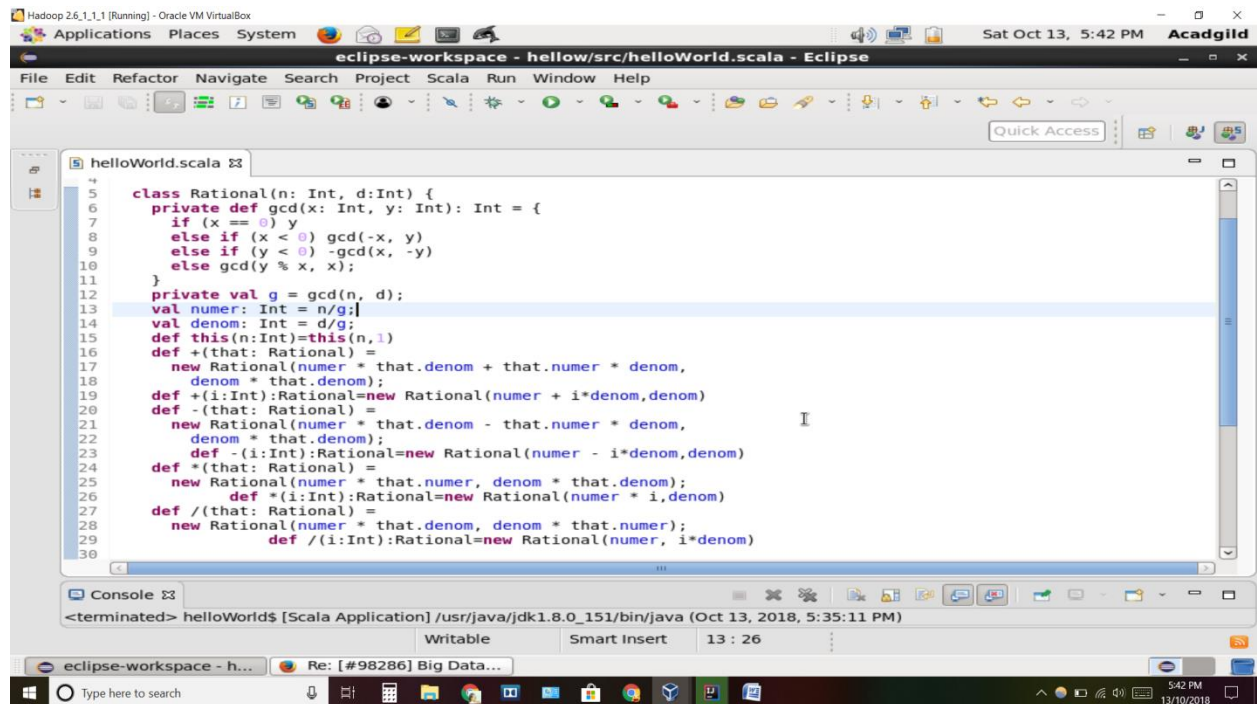
Create a calculator to work with rational numbers.

Requirements:

- It should provide 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.



```
1  class Rational(n: Int, d: Int) {
2      private def gcd(x: Int, y: Int): Int = {
3          if (x == 0) y
4          else if (x < 0) gcd(-x, y)
5          else if (y < 0) -gcd(x, -y)
6          else gcd(y % x, x);
7      }
8      private val g = gcd(n, d);
9      val number: Int = n/g;
10     val denom: Int = d/g;
11     def this(n: Int) = this(n, 1)
12     def +(that: Rational) =
13         new Rational(number * that.denom + that.number * denom,
14             denom * that.denom);
15     def +(i: Int): Rational = new Rational(number + i * denom, denom)
16     def -(that: Rational) =
17         new Rational(number * that.denom - that.number * denom,
18             denom * that.denom);
19     def -(i: Int): Rational = new Rational(number - i * denom, denom)
20     def *(that: Rational) =
21         new Rational(number * that.number, denom * that.denom);
22     def *(i: Int): Rational = new Rational(number * i, denom)
23     def /(that: Rational) =
24         new Rational(number * that.denom, denom * that.number);
25     def /(i: Int): Rational = new Rational(number, i * denom)
26 }
```

Console: <terminated> helloWorld\$ [Scala Application] /usr/java/jdk1.8.0_151/bin/java (Oct 13, 2018, 5:35:11 PM)

Code continued and Answer in console

Hadoop 2.6.1_1.1 [Running] - Oracle VM VirtualBox

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Quick Access

helloWorld.scala

```
27 def /(that: Rational) =
28     new Rational(number * that.denom, denom * that.number);
29     def /(i:Int):Rational=new Rational(number, i*denom)
30
31 override def toString = number + "/" + 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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