Assignment16

Problem Statement

Task 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

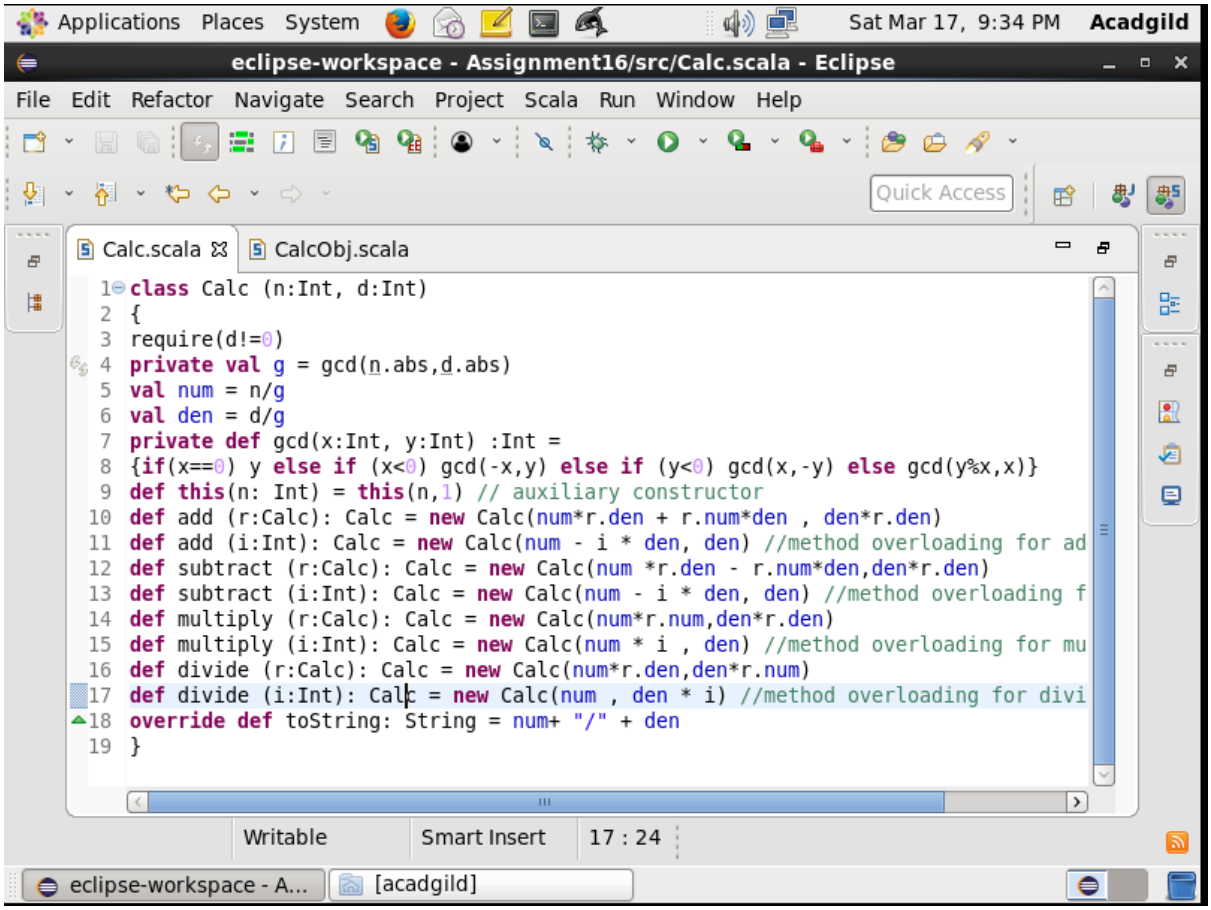
➢ enable method overloading to enable each function to work with numbers and rational

Scala Code:

➔ Create a Scala Class *"Calc"*

```
class Calc (n:Int, d:Int)

{

required(d!=0)

private val g = gcd(n.abs,d.abs)

val num = n/g

val den = d/g


private def gcd(x:Int, y:Int) :Int =
```

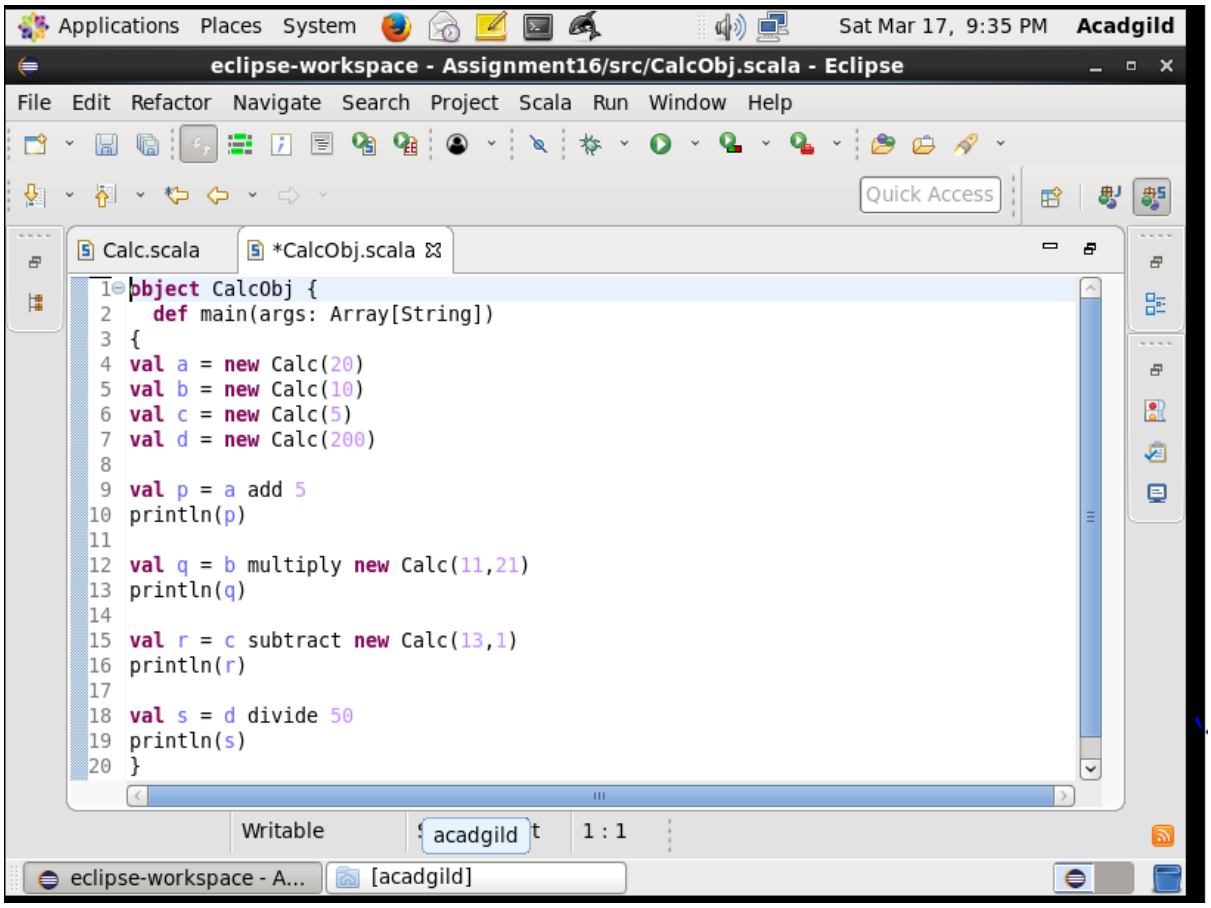
```
{if(x==0) y else if (x<0) gcd(-x,y) else if (y<0) gcd(x,-y) else gcd(y%x,x)}

def this(n: Int) = this(n,1) // auxiliary constructor

def add (r:Calc): Calc = new Calc(num*r.den + r.num*den , den*r.den)
def add (i:Int): Calc = new Calc(num - i * den, den) //method overloading for add

def subtract (r:Calc): Calc = new Calc(num *r.den - r.num*den,den*r.den)
def subtract (i:Int): Calc = new Calc(num - i * den, den) //method overloading for
subtract

def multiply (r:Calc): Calc = new Calc(num*r.num,den*r.den)
def multiply (i:Int): Calc = new Calc(num * i , den) //method overloading for
multiplication

def divide (r:Calc): Clac = new Calc(num*r.den,den*r.num)
def divide (i:Int): Calc = new Calc(num , den * i) //method overloading for division

override def toString: String = num+ "/" + den
}
```



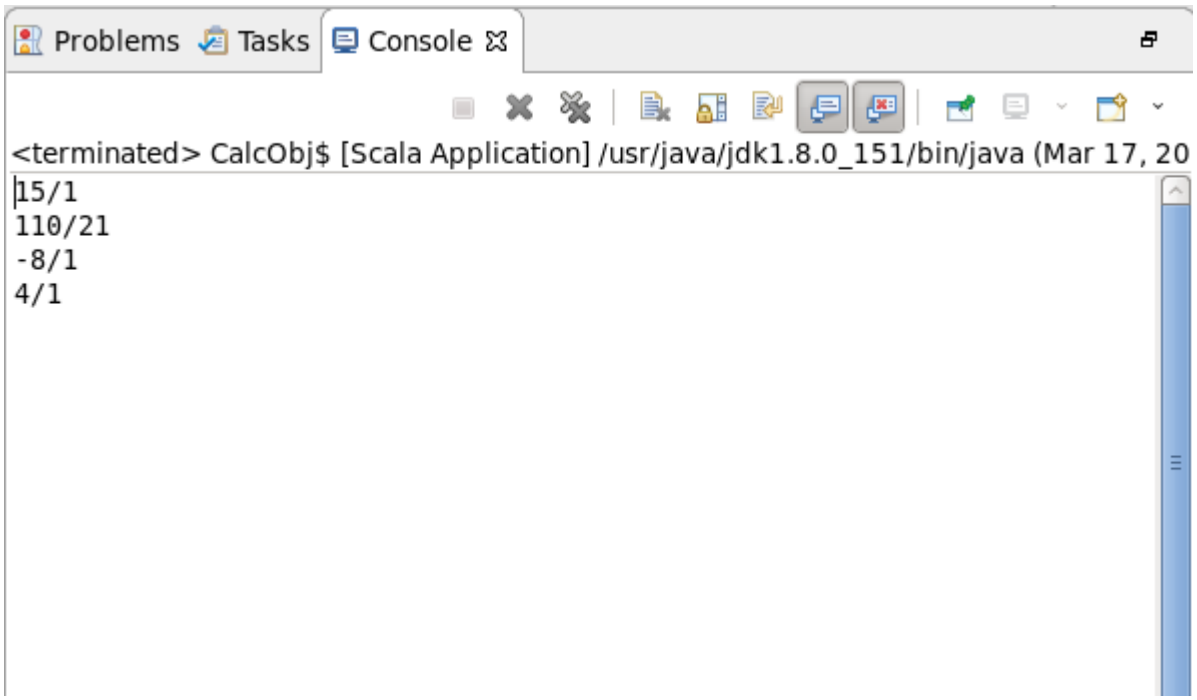
➔ Create Scala object as CalcObj

```
object CalcObj
{
def main(args: Array[String])
{
val a = new Calc(20)
val b = new Calc(10)
val c = new Calc(5)
val d = new Calc(200)
val p = a add 5
println Addition:(p)
val q = b multiply new Calc(11,21)
```

```
println Multiplication(q)

val r = c subtract new Calc(13,1)

println Subraction(r)

val s = d divide 50

println division(s)

}

}
```



Output:


Problems
Tasks
Console
<terminated> CalcObj$ [Scala Application] /usr/java/jdk1.8.0_151/bin/java (Mar 17, 20
15/1
110/21
-8/1
4/1