Assignment-16.1 Scala 3

Task: 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.

Program: Create a Scala Class “Calculator”

```
package core

class Calculator(n:Int, d:Int){
require(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)

def add (r:Calculator): Calculator = new Calculator(num*r.den + r.num*den ,
den*r.den)
def add (i:Int): Calculator = new Calculator(num + i * den, den)

def subtract (r:Calculator): Calculator = new Calculator(num*r.den -
r.num*den,den*r.den)
def subtract (i:Int): Calculator = new Calculator(num - i * den, den)

def multiply (r:Calculator): Calculator = new
Calculator(num*r.num,den*r.den)
def multiply (i:Int): Calculator = new Calculator(num * i , den)

def divide (r:Calculator): Calculator = new Calculator(num*r.den,den*r.num)
def divide (i: Int): Calculator = new Calculator(num , den * i)

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

}
```

- Create the Scala object “CalculatorObj”

Program:

```
package core

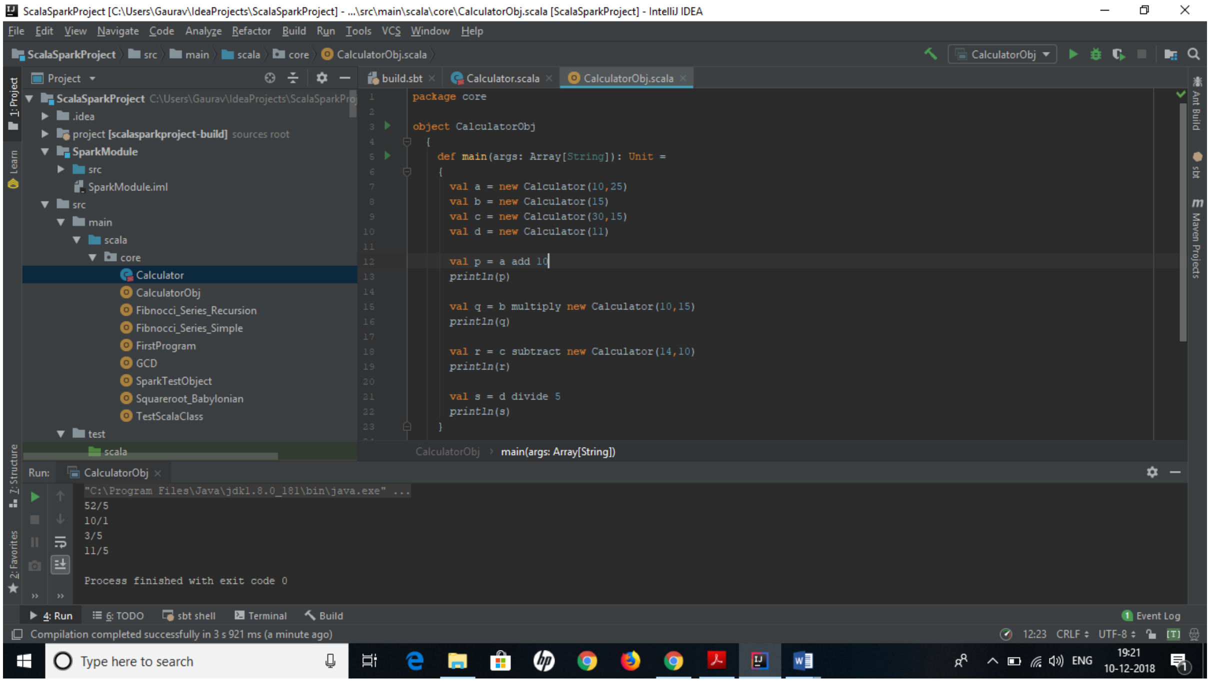
object CalculatorObj
  {
    def main(args: Array[String]): Unit =
    {
      val a = new Calculator(10,25)
      val b = new Calculator(15)
      val c = new Calculator(30,15)
      val d = new Calculator(11)

      val p = a add 10
      println(p)
      val q = b multiply new Calculator(10,15)
      println(q)

      val r = c subtract new Calculator(14,10)
      println(r)

      val s = d divide 5
      println(s)
    }
  }
```

Output:



ScalaSparkProject [C:\Users\Gaurav\IdeaProjects\ScalaSparkProject] - ...\src\main\scala\core\CalculatorObj.scala [ScalaSparkProject] - IntelliJ IDEA

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      println(r)

      val s = d divide 5
      println(s)
    }
```

```
"C:\Program Files\Java\jdk1.8.0_181\bin\java.exe" ...
52/5
10/1
3/5
11/5

Process finished with exit code 0
```

Compilation completed successfully in 3 s 921 ms (a minute ago)