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)

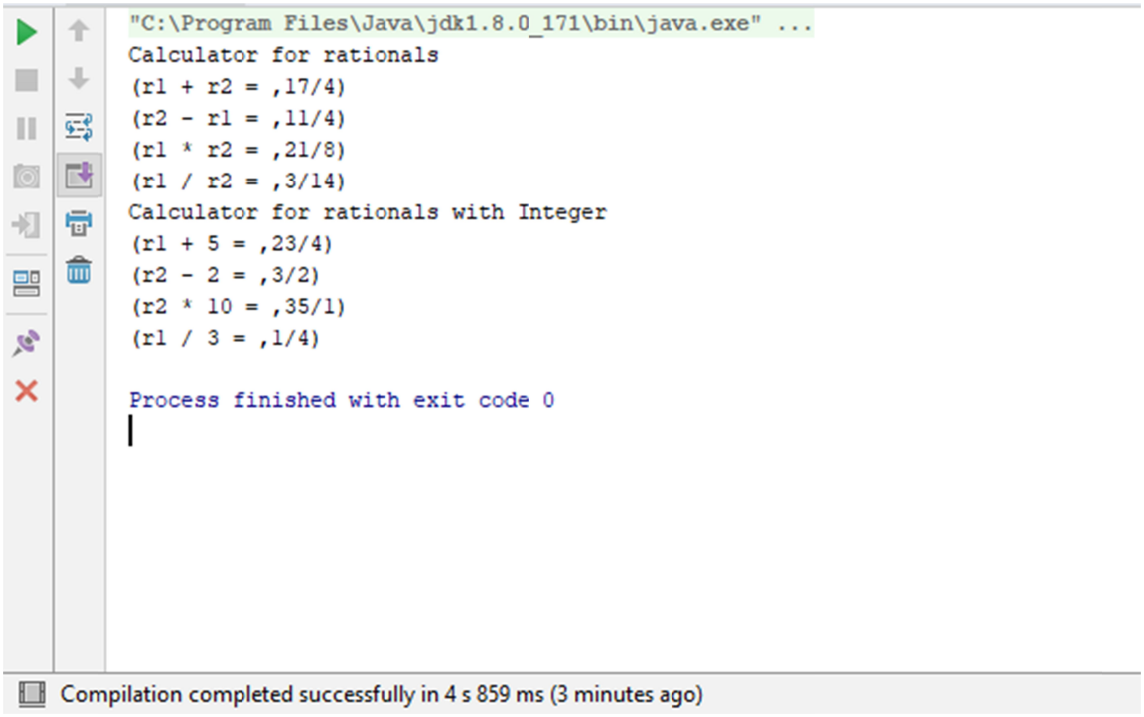
Add option to work with whole numbers which are also rational numbers i.e. (n/1)

➢ achieve the above using auxiliary constructors

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

```
class Rational(n: Int, d: Int) {
  private def gcd(a:Int, b:Int):Int = {
    if(a==b) a
    if(b==0) a else gcd(b, a%b )
  }
  private val g = gcd(n, d)
  val numer: Int = n/g
  val denom: Int = d/g
  def Add(that: Rational) = new Rational(numer * that.denom + that.numer * denom, denom * that.denom)
  def Add(i:Int): Rational = new Rational(numer + i * denom, denom)

  def Subtract(that: Rational) = new Rational(numer * that.denom - that.numer * denom, denom * that.denom)
  def Subtract(i:Int): Rational = new Rational(numer - i * denom, denom)

  def Multiply(that: Rational) = new Rational(numer * that.numer, denom * that.denom)
  def Multiply(i:Int): Rational = new Rational(numer * i, denom)

  def Divide(that: Rational) = new Rational(numer * that.denom, denom * that.numer)
  def Divide(i:Int): Rational = new Rational(numer , denom * i)

  override def toString : String  = numer + "/" + denom
}
```

```
object Rational{
  def main(args: Array[String]): Unit = {
    val r1 = new Rational( 3, 4 )
    val r2 = new Rational( 7, 2 )

    println( "Calculator for rationals" )
    println( "r1 + r2 = " ,  r1 Add r2 )
    println( "r2 - r1 = " , r2 Subtract r1 )
    println( "r1 * r2 = " , r1 Multiply r2 )
    println( "r1 / r2 = " , r1 Divide r2)

    println( "Calculator for rationals with Integer" )
    println( "r1 + 5 = " , r1 Add 5)
    println( "r2 - 2 = " , r2 Subtract 2)
    println( "r2 * 10 = " , r2 Multiply 10 )
    println( "r1 / 3 = " , r1 Divide 3)
  }
}
```


"C:\Program Files\Java\jdk1.8.0_171\bin\java.exe" ...
Calculator for rationals
(r1 + r2 = ,17/4)
(r2 - r1 = ,11/4)
(r1 * r2 = ,21/8)
(r1 / r2 = ,3/14)
Calculator for rationals with Integer
(r1 + 5 = ,23/4)
(r2 - 2 = ,3/2)
(r2 * 10 = ,35/1)
(r1 / 3 = ,1/4)
Process finished with exit code 0
Compilation completed successfully in 4 s 859 ms (3 minutes ago)