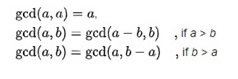
Programming HW6

CS 169 S20, Linnell

 Due Fri. 5/15 in class

Submission instructions at the end

1. (5 points) In Scala, write a recursive function that implements Euclid’s method for finding the greatest common divisor of two positive numbers, as given below.



1. (5 points)  In Scala, write a more general version of the sum\_fun function called apply\_combine that applies a function f(taken as a parameter) to the integers from 1 to x(taken as a parameter), then combines those values using another function g(taken as a parameter).  So combine takes in three parameters: a function f that takes in an Int and returns an Int, an Int x, and a function g that takes in two Ints and returns an Int.  It then returns the result of using the function g to combine the values gained by applying f to 1, 2, …, x.  For example, if I define

def add(x:Int, y:Int) :Int = x+y

def square(x:Int):Int = x\*x

then

combine(square, 4, add)

would return 30

And if I define

def mult(x:Int, y:Int) :Int = x\*y

then

combine((x)=>x, 4, mult)

would return 24

1. (10 points) Write a curried version of the function from problem 2.   Since this function takes three parameters, we're going to do two steps of currying.  This function, apply\_combine2, takes in one parameter, the function f:Int=>Int.  apply\_combine2 then returns a function that takes in one Int parameter, and returns yet another function which in turn takes in a function g:(Int, Int)=>Int and returns the same Int value as apply\_combine.  It’s up to you whether you wish to use named or anonymous functions.

For example, we could use this function in the following ways:

def apply\_square = apply\_combine2((x)=>x\*x)

def apply\_square\_5 = apply\_square(5)

println(apply\_combine2((x)=>x\*x)(5)((x, y)=>x\*y))

**Hint:**  When figuring out your types, start by figuring out the (overall) type of *the function that takes in g* (it’s NOT(Int, Int)=>Int) and use that to figure out the return type of the function that takes in the Int parameter.

Submission instructions:  Please rename your files to Problem1.txt, Problem2.txt, and Problem3.txt before submitting.