Stat 123 Homework 10

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```
knitr::opts_knit$set(root.dir =
"C:\\Users\\jon\\Documents\\School\\R\\HW\\HW10")
```

The greatest common divisor (gcd) of two integers m and n can be calculated using Euclid's Algorithm: Divide m by n. If the remainder is zero, the gcd is n. If not, divide n by the remainder. If the remainder is zero, then the previous remainder is the gcd. If not, continue dividing the remainder into previous remainder until a remainder of zero is obtained. The gcd is the value of the last nonzero remainder.

Using the values 99 and 54, find the gcd using the method above. Hint: The modulos arithematic operator (example x%%y) will return the remainder of dividing x by y.

```
m <- 99
n <- 54
num <- m
den <- n
while(num%%den !=0){
  rem <- num%%den
  num <- den
  den <- rem
}
gcd <- den
gcd
```

```
## [1] 9
```

Now, write a function 'gcd' taking two integers 'm' and 'n' which uses a while loop to find the gcd of two integers m and n.

```
gcd <- function(m, n){
  num <- m
  den <- n
  while(num%%den !=0){
    rem <- num%%den
    num <- den
    den <- rem
  }
  return(den)
}
```

Find the gcd of 143 and 91 using your function.

```
gcd(143, 91)
```

```
## [1] 13
```

Find the gcd of 826 and 602 using your function.

```
gcd(826, 602)
```

```
## [1] 14
```