ASSIGNMENT 7

Oyedayo Oyelowo

1 November 2017

Exercise 1

```
rm(list = ls())
setwd("C:/Users/oyeda/Desktop/R_COURSE/assignment7")
#Load the data
data <- read.table("puudata.txt", header = T, sep = "\t")
```

- *Write an if-statement that compares numbers x and y.*
- *if x is bigger, R prints out for example "x was bigger"*
- *if x and y are equal, R prints: "x and y are equal"*
- *if y is bigger, R prints "y is bigger than x"*

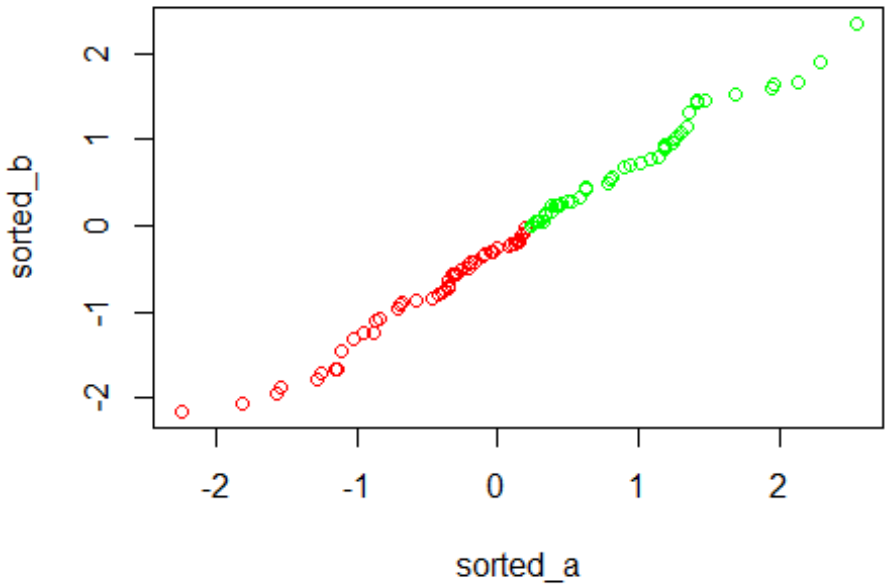
```
x <- 33
y <- 11
{
  if (x > y) {
    print("x was bigger")
  } else if (x == y) {
    print("x and y are equal")
  } else
    print("y is bigger than x")
}
```

```
## [1] "x was bigger"
```

Exercise 2

-Generate two vectors from normal distribution -(function rnorm()) which both contain hundred entries.

```
a = c(rnorm(100))
b = c(rnorm(100))
#Sort both vectors with sort() function.
sorted_a <- sort(a, decreasing = F)
sorted_b <- sort(b, decreasing = F)
#- Plot the vectors (first vector as x-value and second as y-value)

#- Define colors so that negative y-values are drawn as red and
#positive values are drawn as
#green (use for- and if statements inside the plot() function)
plot(sorted_a, sorted_b, col = ifelse(sorted_b < 0, "red", "green"))
```

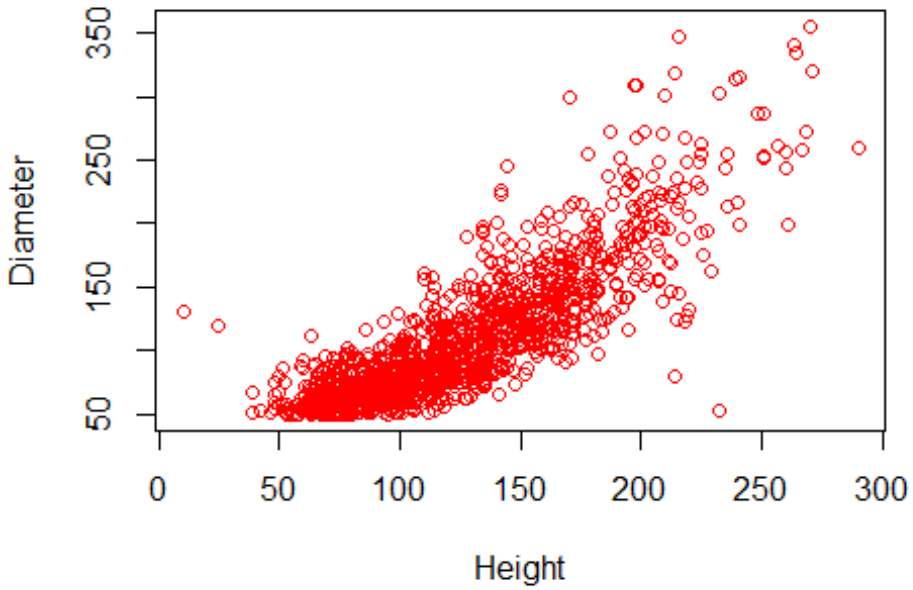



```
#?ifelse
```

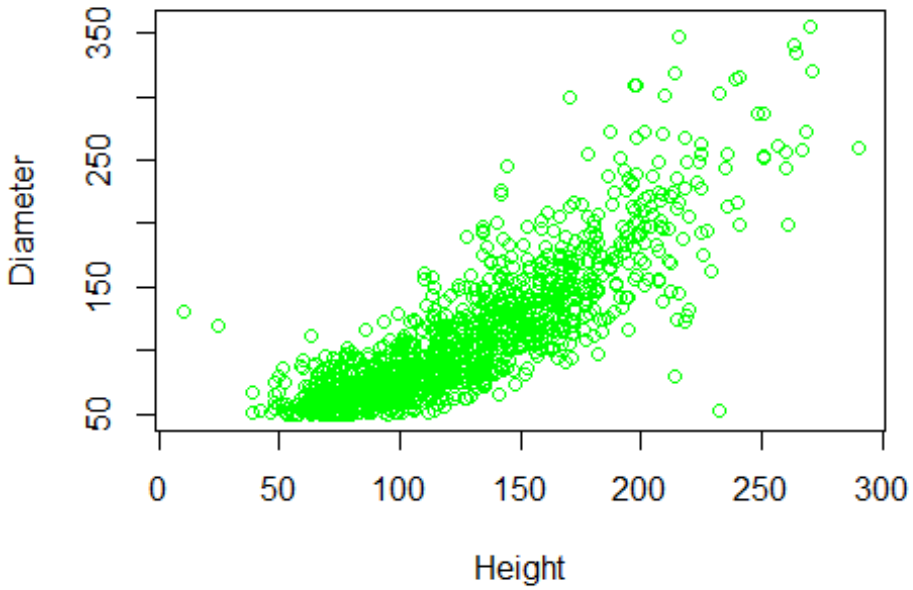
Exercise 3

- Plot the height of all downy birches (PUULAJI=4) that have
- a diameter over 30 cm (x=height,
- y=diameter). Use while() and if() statements.

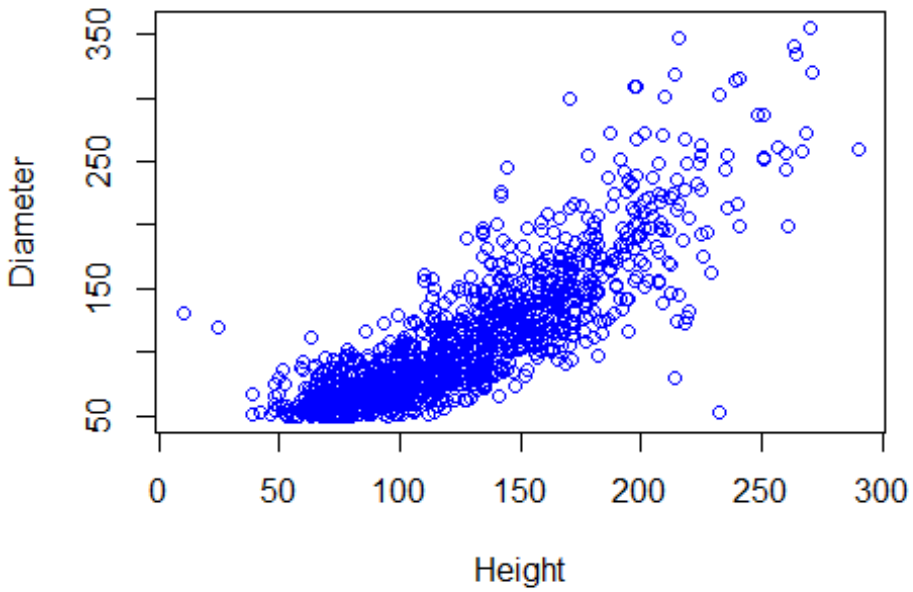
```
#METHOD 1
{
  h <- d <- c()
  i <- 0
  while (i < nrow(data)) {
    i = i + 1
    if (data$PUULAJI[i] == 4 & data$LPM[i] > 30) {
      h <- append(h, data$PITUUS[i])
      d <- append(d, data$LPM[i])

    }

  }
  plot(h,
       d,
       col = "red",
       ylab = "Diameter",
       xlab = "Height")
}
```




```
#par(new = T)

#METHOD2
{
  h <- d <- c()
  for (i in 1:nrow(data)) {
    if (data$PUULAJI[i] == 4 & data$LPM[i] > 30) {
      h <- append(h, data$PITUUS[i])
      d <- append(d, data$LPM[i])
    }

  }
  plot(h,
       d,
       col = "green",
       ylab = "Diameter",
       xlab = "Height")
}
```




```
#dim(data)
#levels(data$PUULAJI)


#METHOD 3
#another way of subsetting
dbirch30 = data[data$PUULAJI == 4 & data$LPM > 30, ]
plot(dbirch30$PITUUS, dbirch30$LPM, col = "blue",
     ylab = "Diameter", xlab = "Height")
```



Exercise 4

- Collect (into a vector) the numbers of those plots that have
- aspen (PUULAJI=5) growing on them.

```
aspen <- c(data[data$PUULAJI == 5, "TUNNISTE"])
length(aspen)
```

```
## [1] 190
```

```
#it can also be done as below:
sdd<- subset(data, data$PUULAJI==5)[,"TUNNISTE"]
```

Exercise 5

- Determine tree-wise basal areas (in cm2) of pines (PUULAJI=1)
- in the puudata. Use for- and -ifstatements. Place the results in a new column.
- Some help:
- Diameter is given in millimeters
- Basal area can be calculated (pi*d^2)/4
- First create an empty vector: for example ba<- c()
- Add the calculated values to the vector with -append() function (check R-help for help)

```
pines <- data[data$PUULAJI == 1,]
#pines_ <- subset(data, data$PUULAJI==1)

#create a new column and convert the basal area into it
#notice that the 0.1 is meant to convert mm to cm
#finally, round off to 2dp
pines$ba <- round((pi * ((pines$LPM * 0.1) ^ 2)) / 4, 2)


#ANOTHER METHOD
{
ba<-c()
for (i in 1:nrow(data)) {
  if (data$PUULAJI[i] == 1) {
    ba <- append(ba, round((((data$LPM[i]*0.1)^2)*pi)/4,2))

  }
}
pines1 <- data[data$PUULAJI == 1,]
pines_ba <- cbind2(pines1, ba)
}


#ANOTHER METHOD USING THE WHILE STATEMENT
{ba2 <- c()
i<-0
while(i<nrow(data)){
  i=i+1
  if (data$PUULAJI[i]==1){
    ba2<- append(ba2, round((((data$LPM[i]*0.1)^2)*pi)/4,2))
  }
}
pines2 <- data[data$PUULAJI == 1,]
```

```
pines_ba2 <- cbind2(pines2, ba2)
}

pines[1:3,]

##    TUNNISTE KOEALA PUUNRO SUUNTA ETAISYYS PUULAJI LATVKERROS LPM PITUUS
## 22       22    764      8     87      976       1          1 225    194
## 23       23    764      9    100      198       1          1 196    165
## 26       26    764     12    117      948       1          1 201    209
##    ELAVALARAJA LATVUSLEV     ba
## 22         129        22 397.61
## 23         121        20 301.72
## 26         119        20 317.31

pines_ba[1:3,]

##    TUNNISTE KOEALA PUUNRO SUUNTA ETAISYYS PUULAJI LATVKERROS LPM PITUUS
## 22       22    764      8     87      976       1          1 225    194
## 23       23    764      9    100      198       1          1 196    165
## 26       26    764     12    117      948       1          1 201    209
##    ELAVALARAJA LATVUSLEV      y
## 22         129        22 397.61
## 23         121        20 301.72
## 26         119        20 317.31

pines_ba2[1:3,]

##    TUNNISTE KOEALA PUUNRO SUUNTA ETAISYYS PUULAJI LATVKERROS LPM PITUUS
## 22       22    764      8     87      976       1          1 225    194
## 23       23    764      9    100      198       1          1 196    165
## 26       26    764     12    117      948       1          1 201    209
##    ELAVALARAJA LATVUSLEV      y
## 22         129        22 397.61
## 23         121        20 301.72
## 26         119        20 317.31
```