Question 5, Homework 1

Joe Froelicher

9/10/2020

# Part A

twos <- vector("double", 250)  
iter <- 0  
  
  
for ( i in seq(9001, 9250, 1) ) {  
 iter = iter + 1  
 twos[iter] <- i  
}  
  
set.seed(8675309)  
rand <- sample(1:250, 30)  
iter <- 0  
sample <- vector("double", 30)  
  
for (r in rand) {  
 iter <- iter + 1  
 sample[iter] <- twos[r]  
}  
  
head(sample)

## [1] 9212 9107 9202 9011 9192 9077

# Part B

setwd("C:/Users/jofro/OneDrive/cu/sem1/methods1/hw1")  
names <- read.table("names.txt")  
colnames(names) <- "name"  
set.seed(8675309)  
team\_prob <- runif(30) # cut off of 0.67 for even teams  
iter <- 0  
  
for (t in team\_prob) {  
 iter <- iter + 1  
  
 if (t <= 0.67) {  
 names$team[iter] <- "red"  
  
 } else {  
 names$team[iter] <- "blue"  
 }  
}  
  
head(names, 10)

## name team  
## 1 Albert red  
## 2 Andy red  
## 3 Annie blue  
## 4 Audrey blue  
## 5 Benjamin red  
## 6 Bob blue  
## 7 Chester blue  
## 8 Dale blue  
## 9 Denise blue  
## 10 Donna red

table(names$team)

##   
## blue red   
## 15 15

# Part C

set.seed(8675309)  
df <- data.frame("id" = 1:10, "age" = runif(10, 20, 60))  
  
older <- subset(df, age >= 45)  
younger <- subset(df, age < 45)  
  
print(older)

## id age  
## 3 3 50.59195  
## 4 4 50.78751  
## 6 6 46.92184  
## 7 7 59.15163  
## 8 8 53.85308  
## 9 9 54.26625

print(younger)

## id age  
## 1 1 26.37935  
## 2 2 39.12753  
## 5 5 30.74194  
## 10 10 37.80641

# Part D

set.seed(8675309)  
assignments <- data.frame(  
 "id" = 1:100,  
 "dietary\_intervention" = runif(100, 0, 1),  
 "pharma\_intervention" = rbinom(100, 1, 0.3)  
)  
  
iter <- 0  
  
for (a in assignments$dietary\_intervention) {  
 iter <- iter + 1  
  
 if ( (a > 0.3) & sum(assignments$dietary\_intervention == "ND") <= 70 ) {  
 assignments$dietary\_intervention[iter] = "ND"  
  
 } else {  
 assignments$dietary\_intervention[iter] = "D"  
 }  
}  
  
iter <- 0  
  
for (a in assignments$pharma\_intervention) {  
 iter <- iter + 1  
  
 if ( a == 1 & sum(assignments$pharma\_intervention == "P") <= 30 ) {  
 assignments$pharma\_intervention[iter] = "P"  
  
 } else {  
 assignments$pharma\_intervention[iter] = "NP"  
 }  
}  
  
table(assignments$dietary\_intervention, assignments$pharma\_intervention)

##   
## NP P  
## D 24 5  
## ND 45 26

# Part E

hospital <- data.frame(  
 "id" = c( rep.int(1, 40), rep.int(2, 40), rep.int(3, 40), rep.int(4, 40), rep.int(5, 40) ),  
 "patient" = c(1:40, 1:40, 1:40, 1:40, 1:40),  
 "improved" = rbinom(200, 1, 0.7)  
)  
  
improved1 <- 0  
improved2 <- 0  
improved3 <- 0  
improved4 <- 0  
improved5 <- 0  
iter <- 0  
  
for (h in hospital$improved) {  
 iter <- iter + 1  
  
 if ( h == 1 & (hospital$id[iter] == 1) ) {  
 improved1 = improved1 + 1  
  
 } else if ( h == 1 & (hospital$id[iter] == 2) ) {  
 improved2 = improved2 + 1  
  
 } else if ( h == 1 & (hospital$id[iter] == 3) ) {  
 improved3 = improved3 + 1  
  
 } else if ( h == 1 & (hospital$id[iter] == 4) ) {  
 improved4 = improved4 + 1  
  
 } else if ( h == 1 & (hospital$id[iter] == 5) ) {  
 improved5 = improved5 + 1  
 }  
}  
  
data.frame(  
 "improvment" = c(  
 improved1 / 40,  
 improved2 / 40,  
 improved3 / 40,  
 improved4 / 40,  
 improved5 / 40,  
 sum(hospital$improved) / 200  
 ),  
 row.names = c(  
 "hospital 1",  
 "hospital 2",  
 "hospital 3",  
 "hospital 4",  
 "hospital 5",  
 "average"  
 )  
)

## improvment  
## hospital 1 0.825  
## hospital 2 0.700  
## hospital 3 0.650  
## hospital 4 0.650  
## hospital 5 0.625  
## average 0.690