2020/12/18(五), 109學年第一學期 資料科學應用 R作業(6)

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# (請依照規定)貼上執行程式碼及執行結果。

詳見: R程式作業繳交方式

http://www.hmwu.idv.tw/web/teaching/doc/R-how-homework.pdf

> #2.9(a) 用for找出number第100個偶數

> set.seed(12345)

> number <- sample(0:100, 1000, replace=T)

> number\_for <- function(x){

+ t <- 0

+ result <- 0

+ for(i in number){

+ if(i %% 2 == 0){

+ result <- result+1

+ t <- t+1

+ }

+ if(t>x)break

+ ans <- i

+ }

+ ans

+ }

> number\_for(100)

[1] 62

>

> #2.9(b) 用repeat找出number第100個偶數

> set.seed(12345)

> number <- sample(0:100, 1000, replace=T)

> number\_repeat <- function(x){

+ t <- 1

+ result <- 0

+ repeat{

+ if(t > x)break

+ result <- result +1

+ t <- t+1

+ }

+ num.while <- which(number%% 2 == 0)

+ return(number[num.while[result]])

+ }

> number\_repeat(100)

[1] 62

>

> #2.9(c) 用while找出number第100個偶數

> set.seed(12345)

> number <- sample(0:100, 1000, replace=T)

> number\_while <- function(x){

+ t <- 1

+ result <- 0

+ while(t<x+1){

+ result <- result +1

+ t <- t+1

+ }

+ #return(result)

+ num.while <- which(number%% 2 == 0)

+ return(number[num.while[result]])

+ }

> number\_while(100)

[1] 62

>

>

> #2.53

> str(mtcars)

'data.frame': 32 obs. of 11 variables:

$ mpg : num 21 21 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 ...

$ cyl : num 6 6 4 6 8 6 8 4 4 6 ...

$ disp: num 160 160 108 258 360 ...

$ hp : num 110 110 93 110 175 105 245 62 95 123 ...

$ drat: num 3.9 3.9 3.85 3.08 3.15 2.76 3.21 3.69 3.92 3.92 ...

$ wt : num 2.62 2.88 2.32 3.21 3.44 ...

$ qsec: num 16.5 17 18.6 19.4 17 ...

$ vs : num 0 0 1 1 0 1 0 1 1 1 ...

$ am : num 1 1 1 0 0 0 0 0 0 0 ...

$ gear: num 4 4 4 3 3 3 3 4 4 4 ...

$ carb: num 4 4 1 1 2 1 4 2 2 4 ...

> mtcars.data <-data.frame(mtcars$disp, mtcars$hp, mtcars$drat, mtcars$wt, mtcars$qsec)

> mtcars.data.1 <- apply(mtcars.data, 2, mean)

> mtcars.data.1

mtcars.disp mtcars.hp mtcars.drat mtcars.wt mtcars.qsec

230.721875 146.687500 3.596563 3.217250 17.848750

>

> tdisp <- tapply(mtcars$cyl, mtcars$disp, mean)

> tdisp

71.1 75.7 78.7 79 95.1 108 120.1 120.3 121 140.8 145 146.7

4 4 4 4 4 4 4 4 4 4 6 4

160 167.6 225 258 275.8 301 304 318 350 351 360 400

6 6 6 6 8 8 8 8 8 8 8 8

440 460 472

8 8 8

> thp <- tapply(mtcars$cyl, mtcars$hp, mean)

> thp

52 62 65 66 91 93 95 97

4.000000 4.000000 4.000000 4.000000 4.000000 4.000000 4.000000 4.000000

105 109 110 113 123 150 175 180

6.000000 4.000000 6.000000 4.000000 6.000000 8.000000 7.333333 8.000000

205 215 230 245 264 335

8.000000 8.000000 8.000000 8.000000 8.000000 8.000000

> tdrat <-tapply(mtcars$cyl, mtcars$drat, mean)

> tdrat

2.76 2.93 3 3.07 3.08 3.15 3.21 3.23

7.000000 8.000000 8.000000 8.000000 7.000000 8.000000 8.000000 8.000000

3.54 3.62 3.69 3.7 3.73 3.77 3.85 3.9

8.000000 6.000000 4.000000 4.000000 8.000000 4.000000 4.000000 6.000000

3.92 4.08 4.11 4.22 4.43 4.93

5.333333 4.000000 4.000000 6.000000 4.000000 4.000000

> twt <-tapply(mtcars$cyl, mtcars$wt, mean)

> twt

1.513 1.615 1.835 1.935 2.14 2.2 2.32 2.465

4.000000 4.000000 4.000000 4.000000 4.000000 4.000000 4.000000 4.000000

2.62 2.77 2.78 2.875 3.15 3.17 3.19 3.215

6.000000 6.000000 4.000000 6.000000 4.000000 8.000000 4.000000 6.000000

3.435 3.44 3.46 3.52 3.57 3.73 3.78 3.84

8.000000 6.666667 6.000000 8.000000 8.000000 8.000000 8.000000 8.000000

3.845 4.07 5.25 5.345 5.424

8.000000 8.000000 8.000000 8.000000 8.000000

> tqsec <-tapply(mtcars$cyl, mtcars$qsec, mean)

> tqsec

14.5 14.6 15.41 15.5 15.84 16.46 16.7 16.87 16.9 17.02 17.05 17.3

8 8 8 6 8 6 4 8 4 7 8 8

17.4 17.42 17.6 17.82 17.98 18 18.3 18.52 18.6 18.61 18.9 19.44

8 8 8 8 8 8 6 4 4 4 5 6

19.47 19.9 20 20.01 20.22 22.9

4 4 4 4 6 4

> #2.62(a)

> computer.s <- function(x){

+ i <- sample(1:3, 1, replace = T)

+ if(i == 1){

+ cat("剪刀")

+ }else if(i == 2){

+ cat("石頭")

+ }else if(i == 3){

+ cat("布")

+ }

+ }

> computer.s()

石頭

> #2.62(b)

> player <- function(x){

+ j <- readline("請輸入你要出的拳頭(a: 剪刀, b: 石頭, c: 布, d: 不玩了):")

+ switch(j,

+ a = cat("玩家出:剪刀"),

+ b = cat("玩家出:石頭"),

+ c = cat("玩家出:布"),

+ d = cat("玩家:不玩了")

+ )

+ }

> player()

請輸入你要出的拳頭(a: 剪刀, b: 石頭, c: 布, d: 不玩了):a

玩家出:剪刀

> #2.62(c)

> set.seed(12345)

> game <- function(x){

+ #玩家出的結果

+ repeat{

+ player <- readline("請輸入你要出的拳頭(a: 剪刀, b: 石頭, c: 布, d: 不玩了):")

+ if(player == "d")break

+ output.1 <- switch(player,

+ a = c("剪刀"),

+ b = c("石頭"),

+ c = c("布"),

+ d = c("玩家:不玩了")

+ )

+

+ #電腦出的結果

+ #set.seed(12345)

+ computer <- sample(1:3, 1, replace = T)

+ output.2 <- if(computer == 1){

+ c("剪刀")

+ }else if(computer == 2){

+ c("石頭")

+ }else if(computer == 3){

+ c("布")

+ }

+

+ #判斷勝負

+ scissors <- c("平手", "輸", "贏")

+ stone <- c("贏", "平手", "輸")

+ five <- c("輸", "贏", "平手")

+ win.lose <- data.frame(scissors, stone, five)

+ rownames(win.lose) <- c("scissors","stone", "five")

+ colnames(win.lose) <- c("a","b", "c")

+ #win.lose

+

+ output.3 <- if((player == "a") & (computer == 1)){

+ win.lose[1,1]

+ }else if ((player == "a") & (computer == 2)){

+ win.lose[2,1]

+ }else if ((player == "a") & (computer == 3)){

+ win.lose[3,1]

+ }else if ((player == "b") & (computer == 1)){

+ win.lose[1,2]

+ }else if ((player == "b") & (computer == 2)){

+ win.lose[2,2]

+ }else if ((player == "b") & (computer == 3)){

+ win.lose[3,2]

+ }else if ((player == "c") & (computer == 1)){

+ win.lose[1,3]

+ }else if ((player == "c") & (computer == 2)){

+ win.lose[2,3]

+ }else if ((player == "c") & (computer == 3)){

+ win.lose[3,3]

+ }

+ #cat(output.3)

+ cat("電腦出[", output.2, "]", "你出[", output.1, "]", "你[", output.3, "]了")

+ }

+ cat("謝謝再會!")

+ }

> game()

請輸入你要出的拳頭(a: 剪刀, b: 石頭, c: 布, d: 不玩了):a

電腦出[ 石頭 ] 你出[ 剪刀 ] 你[ 輸 ]了

請輸入你要出的拳頭(a: 剪刀, b: 石頭, c: 布, d: 不玩了):b

電腦出[ 布 ] 你出[ 石頭 ] 你[ 輸 ]了

請輸入你要出的拳頭(a: 剪刀, b: 石頭, c: 布, d: 不玩了):c

電腦出[ 石頭 ] 你出[ 布 ] 你[ 贏 ]了

請輸入你要出的拳頭(a: 剪刀, b: 石頭, c: 布, d: 不玩了):d

謝謝再會!

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