2020/12/25(五), 109 學年第一學期 資料科學應用 R 作業(5)

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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

```
> #20201225 作業
>
> #ex.2.30(a)
> my.data <- read.table("answer.txt", header=TRUE, sep="\t")
> head(my.data, 5)
   Student V1 V2 V3 V4 V5 V6 V7 V8 V9 V10
1       s1  C  D  D  A  D  A  B  C  C   B
2       s2  B  D  B  D  D  A  C  D  B   B
3       s3  B  A  A  B  D  A  C  B  C   B
4       s4  B  D  B  A  B  C  C  D  C   B
5       s5  B  D  D  D  A  C  C  D  A   B
> #ex.2.30(b)
>
> ans <- c("B", "D", "B", "D", "D", "A", "C", "D", "C", "B")
> s <- c("A", "D", "B", "D", "B", "A", "B", "D", "C", "B")
> correct.item <- which(s == ans)
> n.correct <- length(correct.item) * 10
> correct.item
[1]  2  3  4  6  8  9 10
> n.correct
[1] 70
> #ex.2.30(c)
>
> options(max.print=999999)
> my.data1 <- t(my.data)
> answer <- data.frame(matrix(0,1,192))
>
> ans1 <- t(ans)
> ans2 <- t(ans1)
> for (i in 1:10){
```

```
+     for(j in 1:192){
+         correct.item1 <- which(my.data1[2:(i+1), j] == ans2[1:i,])
+         SS <- length(correct.item1) * 10
+         answer[,j] <- SS
+     }
+ }
> answer <- t(answer)
> my.data2 <- cbind(my.data , answer)
> score.table <- my.data2[,12]
> table(score.table)
score.table
  0  10  20  30  40  50  60  70  80  90 100
  3  10   9  11  19  23  28  40  30  12   7
> #ex.2.30(d)
>
> P <- order(my.data$answer, decreasing = TRUE)
Error in order(my.data$answer, decreasing = TRUE) : 引數 1 不是向量
> topID <- which(my.data$answer >= 75)
> lowID <- which(my.data$answer <= 25)
> n.topID <- length(topID)
> n.lowID <- length(lowID)
> rownames(answer)[topID]
character(0)
> rownames(answer)[lowID]
character(0)
> n.topID
[1] 0
> n.lowID
[1] 0
> #ex.2.51(a)
>
> h <- c("A","A","A","B","B","B","C","C","C","C")
> A1 <- length(grep("A", h))
> B1 <- length(grep("B", h))
> C1 <- length(grep("C", h))
> cat(A1,"A", B1,"B", C1,"C",set = "\t")
3 A 3 B 4 C
> #ex.2.51(b)
```

```
>
> h1 <- c("3A3B4C")
> a1 <- substr(h1,2,2)
> b1 <- substr(h1,4,4)
> c1 <- substr(h1,6,6)
> a2 <- rep(a1,3)
> b2 <- rep(b1,3)
> c2 <- rep(c1,4)
> cat(a2,b2,c2)
A A A B B B C C C C
> #ex.2.52
> pkgs <- c("magrittr", "dplyr")
> install.packages(pkgs)
WARNING: Rtools is required to build R packages but is not currently installed. Please
download and install the appropriate version of Rtools before proceeding:

https://cran.rstudio.com/bin/windows/Rtools/
Installing packages into ‘C:/Users/ASUS/Documents/R/win-library/4.0’
(as ‘lib’ is unspecified)
嘗試  URL 'https://cran.rstudio.com/bin/windows/contrib/4.0/magrittr_2.0.1.zip'
Content type 'application/zip' length 235741 bytes (230 KB)
downloaded 230 KB

嘗試  URL 'https://cran.rstudio.com/bin/windows/contrib/4.0/dplyr_1.0.2.zip'
Content type 'application/zip' length 1306003 bytes (1.2 MB)
downloaded 1.2 MB

package ‘magrittr’ successfully unpacked and MD5 sums checked
package ‘dplyr’ successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\ASUS\AppData\Local\Temp\RtmpAjTIsB\downloaded_packages
> library(magrittr)
> library(dplyr)

Attaching package: ‘dplyr’

The following objects are masked from ‘package:stats’:
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```
    filter, lag

The following objects are masked from 'package:base':

    intersect, setdiff, setequal, union

> require(dplyr)
> compress <- function(){
+     cat("輸入為 ABC 三個字母組成之字串：")
+     n <- scan(what = "LETTERS", quiet = T, nmax = 1)
+     n1 <- strsplit(n,split="") %>% unlist(.,recursive = F)
+     n2 <- as.character(n1)
+     A1 <- length(grep("A", n2))
+     B1 <- length(grep("B", n2))
+     C1 <- length(grep("C", n2))
+     Zz <- paste0(A1,"A", B1,"B", C1,"C")
+     cat(Zz)
+ }
> compress()
輸入為 ABC 三個字母組成之字串：
1: ABAABBAABCCCAC
6A4B4C
> #ex.5.2(a)
>
> set.seed(123456)
> La <- sample(c("白球","白球","白球","白球","白球","白球", "紅球", "紅球", "紅球
", "紅球"),3)
> W <- 0
> R <- 0
> for (i in 1:3){
+     if (La[i] == "白球"){
+         W = W + 1
+     }
+     else{
+         R = R + 1
```

```
+     }
+ }
> Pp <- (choose(6,length(W)) * choose(4,length(R))) / choose(10,3)

> cat("實驗一次的結果：", Pp)

實驗一次的結果： 0.2> cat("印出白球各出現之個數：", W)

印出白球各出現之個數： 2> cat("印出紅球各出現之個數：", R)
印出紅球各出現之個數： 1
> #ex.5.2(b)
>
> DrawResult <- data.frame(matrix(0,10,2))
> for (j in 1:10){
+     La <- sample(c("白球","白球","白球","白球","白球","白球", "紅球", "紅球", "紅球", "紅球"),3)
+     W <- 0
+     R <- 0
+     for (i in 1:3){
+         if (La[i] == "白球"){
+             W = W + 1
+         }
+         else{
+             R = R + 1
+         }
+     }
+     DrawResult[j,1] <- W
+     DrawResult[j,2] <- R
+ }
> DrawResult
    X1 X2
1    2  1
2    2  1
3    1  2
4    2  1
5    2  1
6    1  2
7    2  1
8    2  1
```

```
9      1    2
10     2    1
> #ex5.2(c)
>
> Tt <- 0
> for (j in 1:100){
+      La <- sample(c("白球","白球","白球","白球","白球","白球", "紅球", "紅球", "紅球", "紅球"),3)
+      W <- 0
+      R <- 0
+      for (i in 1:3){
+          if (La[i] == "白球"){
+              W = W + 1
+          }
+          else{
+              R = R + 1
+          }
+      }
+      if (W == 2     && R == 1){
+          Tt    = Tt +1
+      }
+ }
> Tt
[1] 50
> Tt/100
[1] 0.5
>
```