# 2020/12/11(五), 109 學年第一學期 資料科學應用 R 期中考

學號:A106260082　　姓名:姜品君

# (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

```
> # ex1
> study <- function(x){
+     Eng.hr <- c(rep(13:17,time = 5))
+     Comp.hr <- c(rep(8:12,each =5))
+     Tuition <- Eng.hr*400+Comp.hr*600
+     u <- (Eng.hr^(1/2))*(Comp.hr^(1/2))
+     Fit <- ifelse(Tuition <= 12000,'*',' ')
+     study.table <- data.frame(Eng.hr,Comp.hr,Tuition,u,Fit)
+ }
> study.table
   Eng.hr Comp.hr Tuition       u Fit
1      13       8   10000 10.19804   *
2      14       8   10400 10.58301   *
3      15       8   10800 10.95445   *
4      16       8   11200 11.31371   *
5      17       8   11600 11.66190   *
6      13       9   10600 10.81665   *
7      14       9   11000 11.22497   *
8      15       9   11400 11.61895   *
9      16       9   11800 12.00000   *
10     17       9   12200 12.36932
11     13      10   11200 11.40175   *
12     14      10   11600 11.83216   *
13     15      10   12000 12.24745   *
14     16      10   12400 12.64911
15     17      10   12800 13.03840
16     13      11   11800 11.95826   *
17     14      11   12200 12.40967
18     15      11   12600 12.84523
19     16      11   13000 13.26650
```

```
20        17         11     13400 13.67479
21        13         12     12400 12.49000
22        14         12     12800 12.96148
23        15         12     13200 13.41641
24        16         12     13600 13.85641
25        17         12     14000 14.28286

> # ex2(a)
> library(xlsx)
> score <- read.xlsx('Score-109.xlsx', sheetIndex = 1, startRow = 2, encoding = "UTF-
8")
> head(score,5)
      ID Calculus English
1 No.1         72      62
2 No.2         88      97
3 No.3         76      66
4 No.4         89      51
5 No.5         46      15
> tail(score,5)
         ID Calculus English
71 No.71         69      96
72 No.72         51     100
73 No.73         37      50
74 No.74         33      92
75 No.75          4      37
> # ex2(b)
> library(data.table)
> calculus.1 <- as.numeric(score$Calculus)
Warning message:
強制變更過程中產生了 NA
> english.1 <- as.numeric(score$English)
Warning message:
強制變更過程中產生了 NA
> calculus.1[is.na(calculus.1)] <- 0
> english.1[is.na(english.1)] <- 0
> score.1 <- data.frame(score,calculus.1,english.1)
> fail <- ifelse(score.1$calculus.1 < 60 &score.1$english.1 < 60 ,'1','')
> score.2 <- data.frame(score.1,fail)
```

```
> ifelse(score.2$fail==1,score.2$ID,0)
  [1] "0"          "0"          "0"          "0"          "No.5"    "0"          "No.7"    "No.8"    "0"
"0"          "No.11"
[12] "0"          "0"          "0"          "No.15" "0"          "0"          "No.18" "0"          "0"
"No.21" "0"
[23] "0"          "0"          "0"          "No.26" "0"          "0"          "0"          "No.30" "0"
"0"          "No.33"
[34] "0"          "No.35" "0"          "0"          "0"          "No.39" "0"          "0"          "0"
"0"          "0"
[45] "No.45" "No.46" "No.47" "No.48" "0"          "0"          "0"          "0"          "No.53"
"No.54" "0"
[56] "No.56" "0"          "0"          "0"          "0"          "0"          "0"          "0"          "0"
"0"          "No.66"
[67] "0"          "No.68" "0"          "0"          "0"          "0"          "No.73" "0"
"No.75"
>
> # ex2(c)
> mc <- mean(score.2$calculus.1)
> me <- mean(score.2$english.1)
> mc.1 <- sum((score.2$calculus.1-mc)*(score.2$english.1-me))
> mcc <- (sum((score.2$calculus.1-mc)^2)^(1/2))*(sum((score.2$english.1-
me)^2)^(1/2))
> my.cor <- mc.1/mcc
> my.cor
[1] -0.02334661
> # ex2(d)
> cor(score.2$calculus.1,score.2$english.1)
[1] -0.02334661

> # ex3(a)
> x <- c(-3:3)
> y <- ((x-0)^2)/2
> my.dnorm <- (1/((2*pi*1)^(1/2)))^exp(y)
> # ex3(b)
> dnorm <-dnorm(-3:3)
>
> data.frame(x,my.dnorm,dnorm)
      x          my.dnorm              dnorm
```

| | | | |
|---|---|---|---|
| 1 | -3 | 1.188691e-36 | 0.004431848 |
| 2 | -2 | 1.124869e-03 | 0.053990967 |
| 3 | -1 | 2.197920e-01 | 0.241970725 |
| 4 | 0 | 3.989423e-01 | 0.398942280 |
| 5 | 1 | 2.197920e-01 | 0.241970725 |
| 6 | 2 | 1.124869e-03 | 0.053990967 |
| 7 | 3 | 1.188691e-36 | 0.004431848 |