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

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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

```
>
>
>
> # ex1(a)
> study <- function(x,y){
+ 	# x<-c(13:17)
+ 	# y<-c(8:12)
+ 	a <- matrix(0, 25, 5)
+ 	for(x in 13:17){
+ 	    for(y in 8:12){
+ 	        U <- sqrt(x)*sqrt(y)
+ 	        Tuition <- 400*x+600*y
+ 	        fit <- ifelse(Tuition <= 12000, "*", "")
+ 	        cat(x,y, Tuition, U)
+ 	        data.frame(x,y, U, Tuition, fit)
+ 	    }
+ 	     cat("\n")
+ 	}
+
+ }
> study(x,y)
13 8 10000 10.1980413 9 10600 10.8166513 10 11200 11.4017513 11 11800
11.9582613 12 12400 12.49
14 8 10400 10.5830114 9 11000 11.2249714 10 11600 11.8321614 11 12200
12.4096714 12 12800 12.96148
15 8 10800 10.9544515 9 11400 11.6189515 10 12000 12.2474515 11 12600
12.8452315 12 13200 13.41641
16 8 11200 11.3137116 9 11800 1216 10 12400 12.6491116 11 13000 13.266516 12
13600 13.85641
17 8 11600 11.661917 9 12200 12.3693217 10 12800 13.038417 11 13400
```

```
13.6747917 12 14000 14.28286
>
>
>
> # ex2(a)
> library(readxl)
> mydata <- read_excel("data/Score-109.xlsx", na = "NA", skip=1)
> head(mydata, 5)
# A tibble: 5 x 3
   ID       Calculus English
   <chr>       <dbl>     <dbl>
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(mydata, 5)
# A tibble: 5 x 3
   ID       Calculus English
   <chr>       <dbl>     <dbl>
1 No.71          69        96
2 No.72          51       100
3 No.73          37        50
4 No.74          33        92
5 No.75           4        37
>
> # ex2(b)
> mydata[is.na(mydata)] <- 0
> id <- which(( mydata$Calculus <60) & (mydata$English < 60))
> mydata[id, ]
# A tibble: 23 x 3
     ID       Calculus English
     <chr>       <dbl>     <dbl>
 1 No.5           46        15
 2 No.7           32        51
 3 No.8           51         0
 4 No.11           3         0
 5 No.15          39         6
```

```
  6 No.18          40           0
  7 No.21          45          51
  8 No.26          39          29
  9 No.30          48          52
10 No.33          18           0
# ... with 13 more rows
>
> # ex2(c)
> my.cor <- function(x1, x2){
+         # x1 <- sample(0:100, 20, T)
+         # x2 <- sample(0:100, 54, T)
+         n1 <- length(x1)
+         n2 <- length(x2)
+         x1.bar <- mean(x1)
+         x2.bar <- mean(x2)
+         a <- (n1-1)*var(x1)+(n2-1)*var(x2)
+         b <- n1+n2-2
+         sp <- sqrt(a/b)
+         t.stat <- (x1.bar-x2.bar)/(sp*sqrt(1/n1+1/n2))
+         list(means=c(x1.bar, x2.bar),
+                 Pooled.sd=sp,
+                 t.stat=t.stat)
+ }
>
> # ex3(a)
> my.dnorm <- function(x){
+         (exp(-(x^2)/2))/sqrt(2*pi)
+ }
> x <- -3:3
> my.dnorm(x)
[1] 0.004431848 0.053990967 0.241970725 0.398942280 0.241970725
[6] 0.053990967 0.004431848
> dnorm(x)
[1] 0.004431848 0.053990967 0.241970725 0.398942280 0.241970725
[6] 0.053990967 0.004431848
> data.frame(x, my.dnorm, dnorm)
Error in as.data.frame.default(x[[i]], optional = TRUE) :
   cannot coerce class ‘"function"’ to a data.frame
```

>