```
> # 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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>
> #ex1(a)
> study(x,y)
13 8 10000 2613 9 10600 29.2513 10 11200 32.513 11 11800 35.7513 12 12400 39
14 8 10400 2814 9 11000 31.514 10 11600 3514 11 12200 38.514 12 12800 42
15 8 10800 3015 9 11400 33.7515 10 12000 37.515 11 12600 41.2515 12 13200 45
16 8 11200 3216 9 11800 3616 10 12400 4016 11 13000 4416 12 13600 48
17 8 11600 3417 9 12200 38.2517 10 12800 42.517 11 13400 46.7517 12 14000 51
> data.frame(x,y, U , Tuition, Fit)
      ID Calculus English    ID.1 Calculus.1 English.1    U Tuition Fit
1 No.1          72      62 No.71          69          96 26    10000   *
2 No.2          88      97 No.72          51         100 26    10000   *
3 No.3          76      66 No.73          37          50 26    10000   *
4 No.4          89      51 No.74          33          92 26    10000   *
5 No.5          46      15 No.75           4          37 26    10000   *
> list(Eng.hr=x, Comp.hr=y, Tuition=Tuition, U=U )
$Eng.hr
      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

$Comp.hr
       ID Calculus English
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

$Tuition
[1] 10000
```

```
$U
[1] 26

> 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 <- x*(0.5)*y*(0.5)
+             Tuition <- 400*x+600*y
+             fit <- ifelse(Tuition <= 12000, "*", "")
+             cat(x,y, Tuition, U)
+         }
+           cat("\n")
+     }
+ }
> # ex2(a)
> xlsx_file<- "Score-109.xlsx"
> excel_sheets(xlsx_file)
[1] "score"
> MD <-read_excel(xlsx_file,sheet="score",na="NA",skip=1)
> MD1 <- as.data.frame(MD)
> y<-as.data.frame(head(MD1, 5))
> y<-as.data.frame(tail(MD1, 5))
> y
         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
> y
         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)
> MD1[is.na(MD1)] <- 0
> s <- which(MD1[,2] < 60 & MD1[,3] < 60)
> MD1[s,]
          ID Calculus English
5      No.5       46       15
7      No.7       32       51
8      No.8       51        0
11 No.11          3        0
15 No.15         39        6
18 No.18         40        0
21 No.21         45       51
26 No.26         39       29
30 No.30         48       52
33 No.33         18        0
35 No.35         37       21
39 No.39          0       38
45 No.45         26       32
46 No.46         32       56
47 No.47          6       52
48 No.48          4        9
53 No.53         31       18
54 No.54         21       28
56 No.56         50        3
66 No.66         22       52
68 No.68         15       21
73 No.73         37       50
75 No.75          4       37
>
> # ex2(c)
> a1 <- sum(MD1[,2])/75
> b1 <- sum(MD1[,3])/75
> my.cor <-for(i in 1:75){
+      R1 <- (MD1[i,2] - a1)*(MD1[i,3] - b1)
+      R2 <- (MD1[i,2] - a1)*2*0.5
+      R3 <- (MD1[i,3] - b1)*2*0.5
+      R <- R1/(R2*R3)
```

```
+      R
+ }
> # ex2(d)
> cor(MD1[,2:3])
                    Calculus          English
Calculus    1.00000000 -0.02334661
English    -0.02334661  1.00000000
>
> # ex3
>
```