```
> #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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>
> # ex2.9(a)
> set.seed(12345)
> number <- sample(0:100, 1000, replace=T)
> no <- 0
> for(i in 1:length(number)){
+         if(number[i] %% 2 == 0){
+         no <- no +1
+         if(no == 100){
+              cat("even number:",i,"\n")
+              cat("number location:",number[i], "\n")
+               break
+         }
+         }
+ }
even number: 212
number location: 62
>
> # ex2.9(b)
> no <- 0
> repeat{
+         if(number[i] %% 2 == 0){
+               no <- no +1
+               if(no == 100){
+                     cat("even number:",i,"\n")
+                     cat("number location:",number[i], "\n")
+                     break
+               }
+         }
+ }
even number: 212
number location: 62
>
> # ex2.9(c)
> no <- 0
> while(number[i] %% 2 == 0){
```

```
+         no <- no +1
+               if(no == 100){
+                     cat("even number:",i,"\n")
+                     cat("number location:",number[i], "\n")
+               }
+ }
even number: 212
number location: 62

>
> # ex2.53
> mtcars
                          mpg cyl    disp    hp drat       wt    qsec
Mazda RX4                21.0      6 160.0 110 3.90 2.620 16.46
Mazda RX4 Wag            21.0      6 160.0 110 3.90 2.875 17.02
Datsun 710               22.8      4 108.0    93 3.85 2.320 18.61
Hornet 4 Drive           21.4      6 258.0 110 3.08 3.215 19.44
Hornet Sportabout        18.7      8 360.0 175 3.15 3.440 17.02
Valiant                  18.1      6 225.0 105 2.76 3.460 20.22
Duster 360               14.3      8 360.0 245 3.21 3.570 15.84
Merc 240D                24.4      4 146.7    62 3.69 3.190 20.00
Merc 230                 22.8      4 140.8    95 3.92 3.150 22.90
Merc 280                 19.2      6 167.6 123 3.92 3.440 18.30
Merc 280C                17.8      6 167.6 123 3.92 3.440 18.90
Merc 450SE               16.4      8 275.8 180 3.07 4.070 17.40
Merc 450SL               17.3      8 275.8 180 3.07 3.730 17.60
Merc 450SLC              15.2      8 275.8 180 3.07 3.780 18.00
Cadillac Fleetwood    10.4      8 472.0 205 2.93 5.250 17.98
Lincoln Continental 10.4       8 460.0 215 3.00 5.424 17.82
Chrysler Imperial      14.7      8 440.0 230 3.23 5.345 17.42
Fiat 128                 32.4      4    78.7    66 4.08 2.200 19.47
Honda Civic              30.4      4    75.7    52 4.93 1.615 18.52
Toyota Corolla           33.9      4    71.1    65 4.22 1.835 19.90
Toyota Corona            21.5      4 120.1    97 3.70 2.465 20.01
Dodge Challenger         15.5      8 318.0 150 2.76 3.520 16.87
AMC Javelin              15.2      8 304.0 150 3.15 3.435 17.30
Camaro Z28               13.3      8 350.0 245 3.73 3.840 15.41
Pontiac Firebird         19.2      8 400.0 175 3.08 3.845 17.05
```

Fiat X1-9	27.3	4	79.0	66	4.08	1.935	18.90
Porsche 914-2	26.0	4	120.3	91	4.43	2.140	16.70
Lotus Europa	30.4	4	95.1	113	3.77	1.513	16.90
Ford Pantera L	15.8	8	351.0	264	4.22	3.170	14.50
Ferrari Dino	19.7	6	145.0	175	3.62	2.770	15.50
Maserati Bora	15.0	8	301.0	335	3.54	3.570	14.60
Volvo 142E	21.4	4	121.0	109	4.11	2.780	18.60

	vs	am	gear	carb
Mazda RX4	0	1	4	4
Mazda RX4 Wag	0	1	4	4
Datsun 710	1	1	4	1
Hornet 4 Drive	1	0	3	1
Hornet Sportabout	0	0	3	2
Valiant	1	0	3	1
Duster 360	0	0	3	4
Merc 240D	1	0	4	2
Merc 230	1	0	4	2
Merc 280	1	0	4	4
Merc 280C	1	0	4	4
Merc 450SE	0	0	3	3
Merc 450SL	0	0	3	3
Merc 450SLC	0	0	3	3
Cadillac Fleetwood	0	0	3	4
Lincoln Continental	0	0	3	4
Chrysler Imperial	0	0	3	4
Fiat 128	1	1	4	1
Honda Civic	1	1	4	2
Toyota Corolla	1	1	4	1
Toyota Corona	1	0	3	1
Dodge Challenger	0	0	3	2
AMC Javelin	0	0	3	2
Camaro Z28	0	0	3	4
Pontiac Firebird	0	0	3	2
Fiat X1-9	1	1	4	1
Porsche 914-2	0	1	5	2
Lotus Europa	1	1	5	2
Ford Pantera L	0	1	5	4
Ferrari Dino	0	1	5	6

```
Maserati Bora          0    1       5       8
Volvo 142E             1    1       4       2
> Data <- cbind(mtcars$disp, mtcars$hp, mtcars$drat, mtcars$wt, mtcars$qsec)
> colnames(Data) <- c("disp", "hp", "drat", "wt", "qsec")
> Data
                  disp    hp drat       wt    qsec
 [1,] 160.0 110 3.90 2.620 16.46
 [2,] 160.0 110 3.90 2.875 17.02
 [3,] 108.0    93 3.85 2.320 18.61
 [4,] 258.0 110 3.08 3.215 19.44
 [5,] 360.0 175 3.15 3.440 17.02
 [6,] 225.0 105 2.76 3.460 20.22
 [7,] 360.0 245 3.21 3.570 15.84
 [8,] 146.7    62 3.69 3.190 20.00
 [9,] 140.8    95 3.92 3.150 22.90
[10,] 167.6 123 3.92 3.440 18.30
[11,] 167.6 123 3.92 3.440 18.90
[12,] 275.8 180 3.07 4.070 17.40
[13,] 275.8 180 3.07 3.730 17.60
[14,] 275.8 180 3.07 3.780 18.00
[15,] 472.0 205 2.93 5.250 17.98
[16,] 460.0 215 3.00 5.424 17.82
[17,] 440.0 230 3.23 5.345 17.42
[18,]    78.7    66 4.08 2.200 19.47
[19,]    75.7    52 4.93 1.615 18.52
[20,]    71.1    65 4.22 1.835 19.90
[21,] 120.1    97 3.70 2.465 20.01
[22,] 318.0 150 2.76 3.520 16.87
[23,] 304.0 150 3.15 3.435 17.30
[24,] 350.0 245 3.73 3.840 15.41
[25,] 400.0 175 3.08 3.845 17.05
[26,]    79.0    66 4.08 1.935 18.90
[27,] 120.3    91 4.43 2.140 16.70
[28,]    95.1 113 3.77 1.513 16.90
[29,] 351.0 264 4.22 3.170 14.50
[30,] 145.0 175 3.62 2.770 15.50
[31,] 301.0 335 3.54 3.570 14.60
[32,] 121.0 109 4.11 2.780 18.60
```

```
>
> fun1 <- function(x){
+         mean(x)
+ }
> data <- apply(Data, 2, fun1)
> disp <- tapply(mtcars$cyl, mtcars$disp, mean)
> hp <- tapply(mtcars$cyl, mtcars$hp, mean)
> wt <- tapply(mtcars$cyl, mtcars$wt, mean)
> qsec <- tapply(mtcars$cyl, mtcars$qsec, mean)
> data1 <- c(disp, hp, wt, qsec)
> data1
      71.1        75.7        78.7           79        95.1         108
4.000000 4.000000 4.000000 4.000000 4.000000 4.000000
    120.1       120.3         121       140.8         145       146.7
4.000000 4.000000 4.000000 4.000000 6.000000 4.000000
       160       167.6         225         258       275.8         301
6.000000 6.000000 6.000000 6.000000 8.000000 8.000000
       304         318         350         351         360         400
8.000000 8.000000 8.000000 8.000000 8.000000 8.000000
       440         460         472          52          62          65
8.000000 8.000000 8.000000 4.000000 4.000000 4.000000
        66          91          93          95          97         105
4.000000 4.000000 4.000000 4.000000 4.000000 6.000000
       109         110         113         123         150         175
4.000000 6.000000 4.000000 6.000000 8.000000 7.333333
       180         205         215         230         245         264
8.000000 8.000000 8.000000 8.000000 8.000000 8.000000
       335       1.513       1.615       1.835       1.935        2.14
8.000000 4.000000 4.000000 4.000000 4.000000 4.000000
       2.2        2.32       2.465        2.62        2.77        2.78
4.000000 4.000000 4.000000 6.000000 6.000000 4.000000
     2.875        3.15        3.17        3.19       3.215       3.435
6.000000 4.000000 8.000000 4.000000 6.000000 8.000000
      3.44        3.46        3.52        3.57        3.73        3.78
6.666667 6.000000 8.000000 8.000000 8.000000 8.000000
      3.84       3.845        4.07        5.25       5.345       5.424
8.000000 8.000000 8.000000 8.000000 8.000000 8.000000
      14.5        14.6       15.41        15.5       15.84       16.46
```

```
8.000000 8.000000 8.000000 6.000000 8.000000 6.000000
      16.7       16.87         16.9       17.02       17.05         17.3
4.000000 8.000000 4.000000 7.000000 8.000000 8.000000
      17.4       17.42         17.6       17.82       17.98           18
8.000000 8.000000 8.000000 8.000000 8.000000 8.000000
      18.3       18.52         18.6       18.61        18.9       19.44
6.000000 4.000000 4.000000 4.000000 5.000000 6.000000
     19.47        19.9           20       20.01       20.22        22.9
4.000000 4.000000 4.000000 4.000000 6.000000 4.000000
>
> # ex2.62(a)
>
> x <- as.factor(sample(c("剪刀", "石頭", "布"), 1, replace=T))
> x
[1] 石頭
Levels: 石頭
>
> # ex2.62(b)
> y <- function(x){
+       cat("請輸入你要出的拳頭:(a: 剪刀, b: 石頭, c: 布, d: 不玩了):", x,"\n")
+       cat("玩家出:")
+       switch(x,
+              a=cat("剪刀"),
+              b=cat("石頭"),
+              c=cat("布"),
+              d=cat("不玩了"))
+ }
> y("a")
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>
> # ex2.62(c)
> game <- function(){
+       cat("###剪刀石頭布遊戲開始 ###","\n")
+       repeat{
+             computer <- sample(c("剪刀", "石頭", "布"), 1, replace=T)
+             cat("請輸入你要出的拳頭:(a: 剪刀, b: 石頭, c: 布, d: 不玩了):", "\n")
+             x <- scan(what="character", nmax=1, quiet=T)
+             player <- switch(x,
```

```
+                         a="剪刀",
+                         b="石頭",
+                         c="布",
+                         d="不玩了")
+             if((computer == "剪刀" & player == "布")|
+                 (computer == "石頭" & player == "剪刀")|
+                 (computer == "布" & player == "石頭")){
+                   result <- "輸"
+             }else if((computer == "剪刀" & player == "石頭")|
+                           (computer == "石頭" & player == "布")|
+                           (computer == "布" & player == "剪刀")){
+                   result <- "贏"
+             }else{
+                   result <- "平手"}
+              if(player=="不玩了"){
+                    cat("謝謝再會!")
+                    break
+              }else{
+                    cat("電腦出[",computer,"],  你出[", player,"],你[",result,"]
了!","\n","\n")
+              }
+                         }
+       }
> set.seed(12345)
> game()
###剪刀石頭布遊戲開始  ###
請輸入你要出的拳頭:(a:  剪刀, b:  石頭, c:  布, d:  不玩了):
1: 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):
1: 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):
1: 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):
1: d
謝謝再會!
>