Chapter 11

BASIC DATA PROCESSING (3)

相同隨機函數

```
1  a <- rnorm(7)
2  b <- rnorm(7)
3  c <- rnorm(7)
4
5  print(a)
6  print(b)
7  print(c)
```

```
> print(a)
[1]  0.1368632307 -0.2442696242  0.6876664741  0.1633235871  0.2597093943 -0.0003137561 -0.2287564512
> print(b)
[1] -0.25103830 -0.28962192  0.19525438 -0.47750603  0.40187916 -0.11744900  0.07900543
> print(c)
[1] -0.23969388 -1.57809993  1.46816488  0.30426688  1.39592589 -0.06007459 -1.31939263
>
```

```
1  set.seed(3939889)
2
3  a <- rnorm(7)
4  b <- rnorm(7)
5  c <- rnorm(7)
6
7  print(a)
8  print(b)
9  print(c)
10
```

```
> print(a)
[1]  0.36873486  0.73046266 -0.48805044 -1.15607790  0.01568383 -0.77625451 -0.63581280
> print(b)
[1] -0.15758329  1.24302502 -0.96047348 -2.29666078  0.31675175  0.03957523 -0.50589214
> print(c)
[1] -0.2466585 -0.5579667  3.5130740  0.2972947 -0.8410285  0.5434745  0.7917663
```

```
> print(a)
[1]  0.36873486  0.73046266 -0.48805044 -1.15607790  0.01568383 -0.77625451 -0.63581280
> print(b)
[1] -0.15758329  1.24302502 -0.96047348 -2.29666078  0.31675175  0.03957523 -0.50589214
> print(c)
[1] -0.2466585 -0.5579667  3.5130740  0.2972947 -0.8410285  0.5434745  0.7917663
>
```

加總列或行資料

```
1  a <- matrix(1:9, nrow=3)
2  print(a)
3
4  a[1,]<- a[1,]+round(runif(3)*50)
5  a[2,]<- a[2,]+round(runif(3)*60)
6  a[3,]<- a[3,]+round(runif(3)*70)
7
8  print(a)
9
10 a <- rbind(a, sumC = colSums(a))
11 a <- cbind(a, sumR = rowSums(a))
12
13 print(a)
```

```
> a <- matrix(1:9, nrow=3)
> print(a)
     [,1] [,2] [,3]
[1,]    1    4    7
[2,]    2    5    8
[3,]    3    6    9
>
> a[1,]<- a[1,]+round(runif(3)*50)
> a[2,]<- a[2,]+round(runif(3)*60)
> a[3,]<- a[3,]+round(runif(3)*70)
>
> print(a)
     [,1] [,2] [,3]
[1,]   18   31   33
[2,]   42   24   12
[3,]   55   65   68
>
> a <- rbind(a, sumC = colSums(a))
> a <- cbind(a, sumR = rowSums(a))
>
> print(a)
                 sumR
      18  31  33   82
      42  24  12   78
      55  65  68  188
sumC 115 120 113  348
>
```

尋找索引值

```r
a<- array(1:45, dim=c(3,5,3))
print(a)

match(25,a)

which(a==25)
which.min(a)
which.max(a)

which(a==25,arr.ind = TRUE)
```

```
     [,1] [,2] [,3] [,4] [,5]
[1,]    1    4    7   10   13
[2,]    2    5    8   11   14
[3,]    3    6    9   12   15

, , 2

     [,1] [,2] [,3] [,4] [,5]
[1,]   16   19   22   25   28
[2,]   17   20   23   26   29
[3,]   18   21   24   27   30

, , 3

     [,1] [,2] [,3] [,4] [,5]
[1,]   31   34   37   40   43
[2,]   32   35   38   41   44
[3,]   33   36   39   42   45

>
> match(25,a)
[1] 25
>
> which(a==25)
[1] 25
> which.min(a)
[1] 1
> which.max(a)
[1] 45
>
> which(a==25,arr.ind = TRUE)
     dim1 dim2 dim3
[1,]    1    4    2
```

排序

```
1  r_n <- round(runif(20)* 50)
2  print(r_n)
3
4  sort(r_n)
5  sort(r_n, decreasing = TRUE)
6
7
```

Console Terminal ×

~/

```
> r_n <- round(runif(20)* 50)
> print(r_n)
 [1]  4 35 49 38  6 47 28 37 42 32 45 15 25 14 10 38  3  4 11 45
>
> sort(r_n)
 [1]  3  4  4  6 10 11 14 15 25 28 32 35 37 38 38 42 45 45 47 49
> sort(r_n, decreasing = TRUE)
 [1] 49 47 45 45 42 38 38 37 35 32 28 25 15 14 11 10  6  4  4  3
>
```

排序

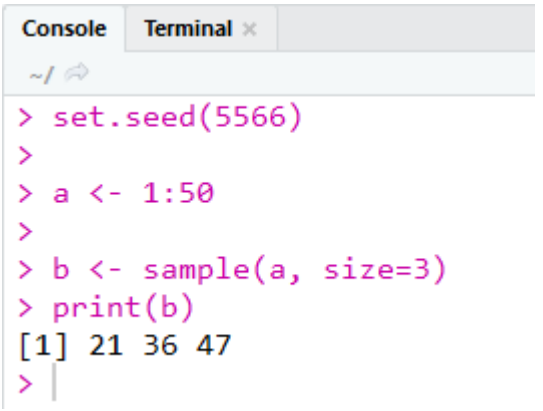
```
1  r_n  <- round(runif(5)* 50)
2  r_n2 <- round(runif(5)* 50)
3
4  df <- data.frame(r_n,r_n2)
5  print(df)
6
7  t <- order(df$r_n)
8  print(t)
9
10 df <- df[t,]
11 print(df)
```

```
> df <- data.frame(r_n,r_n2)
> print(df)
  r_n r_n2
1  37   14
2  49   36
3  45    4
4  39   48
5  47    7
```

```
> t <- order(df$r_n)
> print(t)
[1] 1 4 3 5 2
>
> df <- df[t,]
> print(df)
  r_n r_n2
1  37   14
4  39   48
3  45    4
5  47    7
2  49   36
```

隨機抽樣

```
1  set.seed(5566)
2
3  a <- 1:50
4
5  b <- sample(a, size=3)
6  print(b)
7
8
```



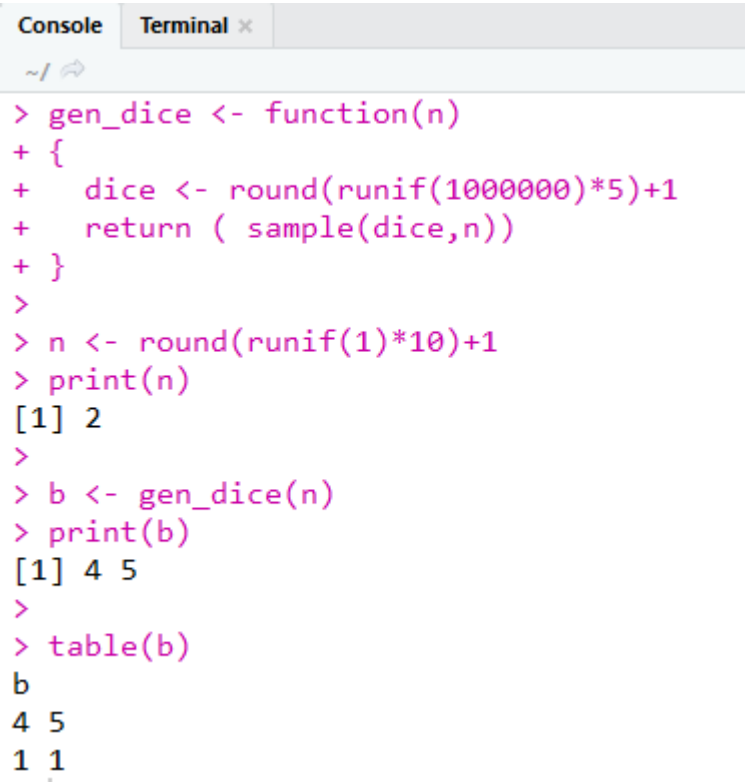
隨機抽樣

```r
gen_dice <- function(n)
{
  dice <- round(runif(1000000)*5)+1
  return ( sample(dice,n))
}

n <- round(runif(1)*10)+1
print(n)

b <- gen_dice(n)
print(b)

table(b)
```



隨堂練習 1

1. 產生 52 張牌 (13 個號碼和 4 個花色 ["♠","♣", "♥", " ♦ "])

```
 [1] "♠ A"  "♣ 2"  "♥ 3"  "♦ 4"  "♠ 5"  "♣ 6"  "♥ 7"  "♦ 8"  "♠ 9"  "♣ 10" "♥ J"  "♦ Q"  "♠ K"  "♣ A"  "♥ 2"
[16] "♦ 3"  "♠ 4"  "♣ 5"  "♥ 6"  "♦ 7"  "♠ 8"  "♣ 9"  "♥ 10" "♦ J"  "♠ Q"  "♣ K"  "♥ A"  "♦ 2"  "♠ 3"  "♣ 4"
[31] "♥ 5"  "♦ 6"  "♠ 7"  "♣ 8"  "♥ 9"  "♦ 10" "♠ J"  "♣ Q"  "♥ K"  "♦ A"  "♠ 2"  "♣ 3"  "♥ 4"  "♦ 5"  "♠ 6"
[46] "♣ 7"  "♥ 8"  "♦ 9"  "♠ 10" "♣ J"  "♥ Q"  "♦ K"
```

2. 利用隨機變數發牌

```
> print(n)
[1] 37
>
> a <- gen_card(n)
> print(a)
 [1] "♦ K"  "♥ 3"  "♦ J"  "♥ 10" "♦ Q"  "♥ 7"  "♠ 3"  "♥ K"  "♣ K"  "♦ 9"  "♣ 3"  "♣ 9"  "♦ 2"  "♥ A"  "♥ 9"
[16] "♦ A"  "♣ 6"  "♠ 6"  "♦ 4"  "♦ 6"  "♣ 2"  "♥ J"  "♥ 8"  "♦ 5"  "♥ 5"  "♣ 7"  "♠ 7"  "♠ 10" "♠ 9"  "♦ 10"
[31] "♠ 2"  "♠ 5"  "♦ 7"  "♠ K"  "♠ Q"  "♥ Q"  "♥ 2"
```

Any Questions !?