Chapter 4

IF-ELSE/LOOP

條件分支

程式會按照當時判斷式的答案，來分別執行不同的動作

舉例來說

當你去 7-11 要買花雕雞麵或是阿 Q 桶麵時，發現你身上只有 50 元

所以在買不起花雕雞麵的情況下，只能選擇阿 Q 桶麵

流程控制

if-else 使用方式

```
if (condition 1)
{
   statement 1
} else
{
   statement 3
}
```

```r
bmia <- 35

if(bmia>32){
  print("你太胖了")
} else{
  print("還可以")
}
```

```
Console  Terminal
~/
> bmia <- 35
>
> if(bmia>32){
+   print("你太胖了")
+ } else{
+   print("還可以")
+ }
[1] "你太胖了"
>
```

流程控制

if-elseif-else 使用方式

```
if (condition 1)
{
   statement 1
} else if (condition 2)
{
   statement 2
} else
{
   statement 3
}
```

```
1  bmia <- 28
2
3  if(bmia>32){
4    print("你太胖了")
5  } else if(25<= bmia & bmia <=32){
6    print("還可以")
7  } else{
8    print("太瘦了")
9  }
```

Console Terminal

```
> bmia <- 28
>
> if(bmia>32){
+   print("你太胖了")
+ } else if(25<= bmia & bmia <=32){
+   print("還可以")
+ } else{
+   print("太瘦了")
+ }
[1] "還可以"
>
```

迴圈

什麼是迴圈？

當我們要重複執行相同的動作，就需要使用迴圈跟電腦說它該作的事

ex. 當你去 7-11 買 Java 咖哩飯的時候，店員會

1. 結帳並找錢
2. 放入微波爐加熱
3. 準備提袋，並放入餐具
4. 把咖哩飯從微波爐拿出來
5. 打包所有的東西給客人

迴圈

什麼是迴圈？

如果沒有重複的動作寫成迴圈，那會讓程式變的非常的亂

ex, 有人一次買了 10 碗 Java 咖哩飯…

1. 結帳並找錢
2. 放入微波爐加熱
3. 準備提袋，並放入餐具
4. 把咖哩飯從微波爐拿出來
5. 打包所有的東西給客人

…1-5 的動作就要 copy and paste 一樣的程式碼 10 次…

沒有迴圈的例子

```r
a <- month.name
print(a)

print(a[1])
print(a[2])
print(a[3])
print(a[4])
print(a[5])

```

```
> a <- month.name
> print(a)
 [1] "January"   "February"  "March"     "April"     "May"       "June"      "July"      "August"    "September"
[10] "October"   "November"  "December"
>
> print(a[1])
[1] "January"
> print(a[2])
[1] "February"
> print(a[3])
[1] "March"
> print(a[4])
[1] "April"
> print(a[5])
[1] "May"
>
```

for loop

```r
a <- month.name

for( i in a)
{
  print(i)
}
```

for loop 使用方式

```
for ( 變數基底 in 變數 )
{
    要執行的程式
}
```

```
> a <- month.name
>
> for( i in a)
+ {
+   print(i)
+ }
[1] "January"
[1] "February"
[1] "March"
[1] "April"
[1] "May"
[1] "June"
[1] "July"
[1] "August"
[1] "September"
[1] "October"
[1] "November"
[1] "December"
>
```

while loop

while loop 使用方式

```
while ( boolean expression)
{
    要執行的程式
}
```

```
1  a <- month.name
2
3  i <- 1
4  while(i<13)
5  {
6    print (a[i])
7    i<-i+1
8  }
```

```
> a <- month.name
>
> i <- 1
> while(i<13)
+ {
+   print (a[i])
+   i<-i+1
+ }
[1] "January"
[1] "February"
[1] "March"
[1] "April"
[1] "May"
[1] "June"
[1] "July"
[1] "August"
[1] "September"
[1] "October"
[1] "November"
[1] "December"
>
```

Break (中斷)

Break 使用方式

```
for / while loop
{
    if(condition == TRUE)
    {
        要執行的程式
        break
    }
}
```

```
1  a <- 1:10
2  for (i in a)
3  {
4    if(i %% 5 ==0)
5    {
6      print("跳出迴圈")
7      break
8    } else{
9      print(i)
10   }
11 }
```

Console Terminal

```
> a <- 1:10
> for (i in a)
+ {
+   if(i %% 5 ==0)
+   {
+     print("跳出迴圈")
+     break
+   } else{
+     print(i)
+   }
+ }
[1] 1
[1] 2
[1] 3
[1] 4
[1] "跳出迴圈"
>
```

隨堂練習 1

請用二層迴圈印出 9 9 乘法表

```
[1] "7 * 3 = 21"
[1] "7 * 4 = 28"
[1] "7 * 5 = 35"
[1] "7 * 6 = 42"
[1] "7 * 7 = 49"
[1] "7 * 8 = 56"
[1] "7 * 9 = 63"
[1] "8 * 1 = 8"
[1] "8 * 2 = 16"
[1] "8 * 3 = 24"
[1] "8 * 4 = 32"
[1] "8 * 5 = 40"
[1] "8 * 6 = 48"
[1] "8 * 7 = 56"
[1] "8 * 8 = 64"
[1] "8 * 9 = 72"
[1] "9 * 1 = 9"
[1] "9 * 2 = 18"
[1] "9 * 3 = 27"
[1] "9 * 4 = 36"
[1] "9 * 5 = 45"
[1] "9 * 6 = 54"
[1] "9 * 7 = 63"
[1] "9 * 8 = 72"
[1] "9 * 9 = 81"
>
```

Any Questions !?