

# Chapter 13

---

## DATA PREPROCESSING

# 資料集

除了一些內建的資料集

可使用 ” **datasets** ” 這個套件取得更多 dataset

```
1 data (package = "datasets")
```

```
Data sets in package 'datasets':
```

AirPassengers	Monthly Airline Passenger Numbers 1949-1960
BJsales	Sales Data with Leading Indicator
BJsales.lead (BJsales)	Sales Data with Leading Indicator
BOD	Biochemical Oxygen Demand
CO2	Carbon Dioxide Uptake in Grass Plants
ChickWeight	Weight versus age of chicks on different diets
DNase	Elisa assay of DNase
iris	Edgar Anderson's Iris Data
iris3	Edgar Anderson's Iris Data
islands	Areas of the World's Major Landmasses
ldeaths (UKLungDeaths)	Monthly Deaths from Lung Diseases in the UK
lh	Luteinizing Hormone in Blood Samples
longley	Longley's Economic Regression Data
lynx	Annual Canadian Lynx trappings 1821-1934
mdeaths (UKLungDeaths)	Monthly Deaths from Lung Diseases in the UK
morley	Michelson Speed of Light Data

# 資料集

也可使用 ” `.package(all.available = TRUE)` 找到其他套件中的資料集

```
data(package = .packages(all.available=TRUE))|
```

```
Data sets in package ;%boot%;:
```

acme	Monthly Excess Returns
aids	Delay in AIDS Reporting in England and Wales
aircondit	Failures of Air-conditioning Equipment
aircondit7	Failures of Air-conditioning Equipment
amis	Car Speeding and Warning Signs
aml	Remission Times for Acute Myelogenous Leukaemia
beaver	Beaver Body Temperature Data

```
Data sets in package ;%cluster%;:
```

agriculture	European Union Agricultural Workforces
animals	Attributes of Animals
chorSub	Subset of C-horizon of Kola Data
flower	Flower Characteristics
plantTraits	Plant Species Traits Data
pluton	Isotopic Composition Plutonium Batches
ruspini	Ruspini Data
votes.repub	Votes for Republican Candidate in Presidential Elections
xclara	Bivariate Data Set with 3 Clusters

# 資料集

使用 `?+ 資料集名稱` 可以看到說明文件

```
?iris
```

R: Edgar Anderson's Iris Data ▾

Find in Topic

iris {datasets}

R Documentation

## Edgar Anderson's Iris Data

### Description

This famous (Fisher's or Anderson's) iris data set gives the measurements in centimeters of the variables sepal length and width and petal length and width, respectively, for 50 flowers from each of 3 species of iris. The species are *Iris setosa*, *versicolor*, and *virginica*.

### Usage

```
iris  
iris3
```

### Format

`iris` is a data frame with 150 cases (rows) and 5 variables (columns) named `Sepal.Length`, `Sepal.Width`, `Petal.Length`, `Petal.Width`, and `Species`.

`iris3` gives the same data arranged as a 3-dimensional array of size 50 by 4 by 3, as represented by S-PLUS. The first dimension gives the case number within the species subsample, the second the measurements with names `Sepal L.`, `Sepal W.`, `Petal L.`, and `Petal W.`, and the third the species.

# 資料前處理

接下來我們要以 mice 套件中的 **nhanes2 資料集** 來進行資料前置處理

1. 安裝並讀取以下四個套件
2. 得到 nhanes2 dataset 的值

```
1 install.packages("lattice")
2 install.packages("MASS")
3 install.packages("nnet")
4 install.packages("mice")
5
6 library(lattice)
7 library(MASS)
8 library(nnet)
9 library(mice)
10
11 ds <- nhanes2
12
13 View(ds)
14 |
```

	age	bmi	hyp	chl
1	20-39	NA	NA	NA
2	40-59	22.7	no	187
3	20-39	NA	no	187
4	60-99	NA	NA	NA
5	20-39	20.4	no	113
6	60-99	NA	NA	184
7	20-39	22.5	no	118
8	20-39	30.1	no	187
9	40-59	22.0	no	238
10	40-59	NA	NA	NA
11	20-39	NA	NA	NA
12	40-59	NA	NA	NA

13	60-99	21.7	no	206
14	40-59	28.7	yes	204
15	20-39	29.6	no	NA
16	20-39	NA	NA	NA
17	60-99	27.2	yes	284
18	40-59	26.3	yes	199
19	20-39	35.3	no	218
20	60-99	25.5	yes	NA
21	20-39	NA	NA	NA
22	20-39	33.2	no	229
23	20-39	27.5	no	131
24	60-99	24.9	no	NA
25	40-59	27.4	no	186

# 資料前處理

## 解析 nhanes2 資料集

```
13 summary(ds)
14 |
```

```
age      bmi      hyp      chl
20-39:12  Min.    :20.40  no   :13  Min.    :113.0
40-59: 7  1st Qu.:22.65  yes  : 4  1st Qu.:185.0
60-99: 6  Median :26.75  NA's: 8  Median :187.0
          Mean   :26.56          Mean   :191.4
          3rd Qu.:28.93          3rd Qu.:212.0
          Max.   :35.30          Max.    :284.0
          NA's   :9              NA's    :10
```

```
> |
```

Factor	meaning
age	年齡
bmi	BMI 指數
hyp	高血壓 0/1
chl	膽固醇 mg/dL

```
14
15 head(ds)
16
```

```
> head(ds)
      age  bmi  hyp chl
1 20-39   NA <NA>  NA
2 40-59 22.7   no 187
3 20-39   NA   no 187
4 60-99   NA <NA>  NA
5 20-39 20.4   no 113
6 60-99   NA <NA> 184
> |
```

# 資料前處理

## 遺漏值處理

### 1. 檢測資料缺失的情況

```
1 library(lattice)
2 library(MASS)
3 library(nnet)
4 library(mice)
5
6 ds <- nhanes2
7
8 lose <- md.pattern(nhanes2)
9 print(lose)
```

	age	hyp	bmi	chl	
13	1	1	1	1	0
1	1	1	0	1	1
3	1	1	1	0	1
1	1	0	0	1	2
7	1	0	0	0	3
	0	8	9	10	27

	age	bmi	hyp	chl
1	20-39	NA	NA	NA
2	40-59	22.7	no	187
3	20-39	NA	no	187
4	60-99	NA	NA	NA
5	20-39	20.4	no	113
6	60-99	NA	NA	184
7	20-39	22.5	no	118
8	20-39	30.1	no	187
9	40-59	22.0	no	238
10	40-59	NA	NA	NA
11	20-39	NA	NA	NA
12	40-59	NA	NA	NA

13	60-99	21.7	no	206
14	40-59	28.7	yes	204
15	20-39	29.6	no	NA
16	20-39	NA	NA	NA
17	60-99	27.2	yes	284
18	40-59	26.3	yes	199
19	20-39	35.3	no	218
20	60-99	25.5	yes	NA
21	20-39	NA	NA	NA
22	20-39	33.2	no	229
23	20-39	27.5	no	131
24	60-99	24.9	no	NA
25	40-59	27.4	no	186

# 資料前處理

## 遺漏值處理

### 1. 檢測資料缺失的情況

```
1 library(lattice)
2 library(MASS)
3 library(nnet)
4 library(mice)
5
6 ds <- nhanes2
7
8 lose <- md.pattern(nhanes2)
9 print(lose)
```

	age	hyp	bmi	chl	
13	1	1	1	1	0
1	1	1	0	1	1
3	1	1	1	0	1
1	1	0	0	1	2
7	1	0	0	0	3
	0	8	9	10	27

2.R x		ds x					
				Filter			
	age	bmi	hyp	chl			
1	20-39	NA	NA	NA			
2	40-59	22.7	no	187			
3	20-39	NA	no	187			
4	60-99	NA	NA	NA			
5	20-39	20.4	no	113			
6	60-99	NA	NA	184			
7	20-39	22.5	no	118			
8	20-39	30.1	no	187			
9	40-59	22.0	no	238			
10	40-59	NA	NA	NA			
11	20-39	NA	NA	NA			
12	40-59	NA	NA	NA			

13	60-99	21.7	no	206
14	40-59	28.7	yes	204
15	20-39	29.6	no	NA
16	20-39	NA	NA	NA
17	60-99	27.2	yes	284
18	40-59	26.3	yes	199
19	20-39	35.3	no	218
20	60-99	25.5	yes	NA
21	20-39	NA	NA	NA
22	20-39	33.2	no	229
23	20-39	27.5	no	131
24	60-99	24.9	no	NA
25	40-59	27.4	no	186



# 資料前處理

## 遺漏值處理

### 1. 檢測資料缺失的情況

```
1 library(lattice)
2 library(MASS)
3 library(nnet)
4 library(mice)
5
6 ds <- nhanes2
7
8 lose <- md.pattern(nhanes2)
9 print(lose)
```

	age	hyp	bmi	chl	
13	1	1	1	1	0
1	1	1	0	1	1
3	1	1	1	0	1
1	1	0	0	1	2
7	1	0	0	0	3
	0	8	9	10	27

2.R x		ds x					
		Filter					
	age	bmi	hyp	chl			
1	20-39	NA	NA	NA			
2	40-59	22.7	no	187			
3	20-39	NA	no	187			
4	60-99	NA	NA	NA			
5	20-39	20.4	no	113			
6	60-99	NA	NA	184			
7	20-39	22.5	no	118			
8	20-39	30.1	no	187			
9	40-59	22.0	no	238			
10	40-59	NA	NA	NA			
11	20-39	NA	NA	NA			
12	40-59	NA	NA	NA			

13	60-99	21.7	no	206
14	40-59	28.7	yes	204
15	20-39	29.6	no	NA
16	20-39	NA	NA	NA
17	60-99	27.2	yes	284
18	40-59	26.3	yes	199
19	20-39	35.3	no	218
20	60-99	25.5	yes	NA
21	20-39	NA	NA	NA
22	20-39	33.2	no	229
23	20-39	27.5	no	131
24	60-99	24.9	no	NA
25	40-59	27.4	no	186

# 資料前處理

## 遺漏值處理

### 2-1. 刪除法 : remove 去有缺值的部份

```
1 library(lattice)
2 library(MASS)
3 library(nnet)
4 library(mice)
5
6 ds <- nhanes2
7
8 test <- complete.cases(ds)
9 print(test)
10
11 rm <- ds[complete.cases(ds), ]
12 View(rm)
```

	age	bmi	hyp	chl
2	40-59	22.7	no	187
5	20-39	20.4	no	113
7	20-39	22.5	no	118
8	20-39	30.1	no	187
9	40-59	22.0	no	238
13	60-99	21.7	no	206
14	40-59	28.7	yes	204
17	60-99	27.2	yes	284
18	40-59	26.3	yes	199
19	20-39	35.3	no	218
22	20-39	33.2	no	229
23	20-39	27.5	no	131
25	40-59	27.4	no	186

```
> test <- complete.cases(ds)
```

```
> print(test)
```

```
[1] FALSE TRUE FALSE FALSE TRUE FALSE TRUE TRUE TRUE FALSE FALSE FALSE TRUE TRUE FALSE FALSE TRUE TRUE
[19] TRUE FALSE FALSE TRUE TRUE FALSE TRUE
```

# 資料前處理

## 遺漏值處理

2-2. 插補法：利用統計方法填補缺失值 (ex. 平均值)

Step 1. 算出所有非 NA 的 bmi 平均值

Step 2. 寫入 BMI 有缺少的欄位)

```
1 library(lattice)
2 library(MASS)
3 library(nnet)
4 library(mice)
5
6 ds <- nhanes2
7 head(ds)
8 mean <- mean(ds[, 2],
9              na.rm = T)
10 mean
11
12 ds[is.na(ds[, 2]), 2] <- mean
13 head(ds)
```

```
> ds <- nhanes2
> head(ds)
   age  bmi  hyp chl
1 20-39  NA <NA>  NA
2 40-59 22.7  no  187
3 20-39  NA  no  187
4 60-99  NA <NA>  NA
5 20-39 20.4  no  113
6 60-99  NA <NA> 184
```

```
> mean <- mean(ds[, 2],
+              na.rm = T)
> mean
[1] 26.5625
```

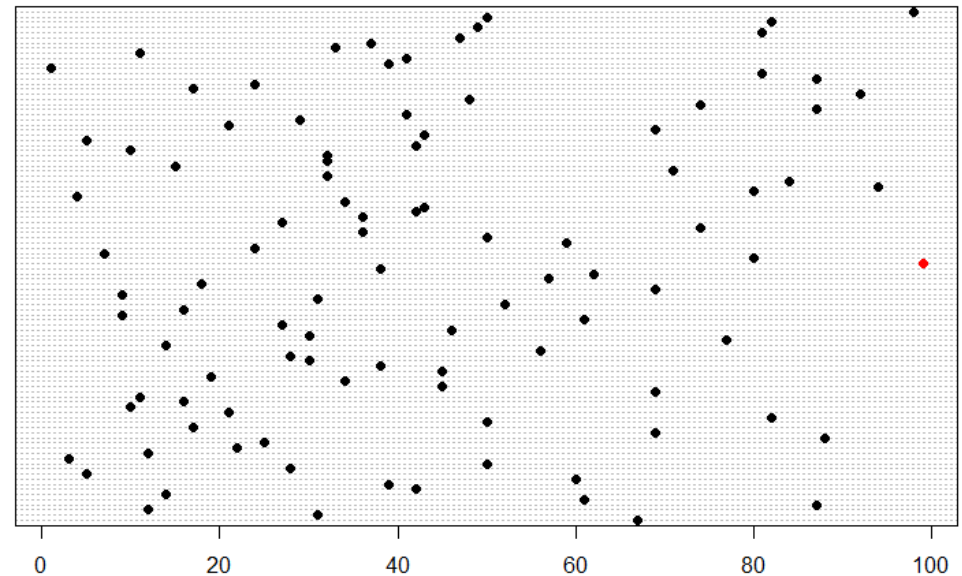
```
> ds[is.na(ds[, 2]), 2] <- mean
> head(ds)
   age  bmi  hyp chl
1 20-39 26.5625 <NA>  NA
2 40-59 22.7000  no  187
3 20-39 26.5625  no  187
4 60-99 26.5625 <NA>  NA
5 20-39 20.4000  no  113
6 60-99 26.5625 <NA> 184
```

# 資料前處理

## 雜訊資料處理

### 1. 找出資料中的例外點

```
1 rm(list=ls())
2 library(lattice)
3 library(MASS)
4 library(nnet)
5 library(mice)
6 library(DMwR)
7 library(outliers)
8
9 y=round(runif(100)*100)
10 print(y)
11 dotchart(y,col=ifelse(y==outlier(y),
12                      "red","black"),pch=19)
```

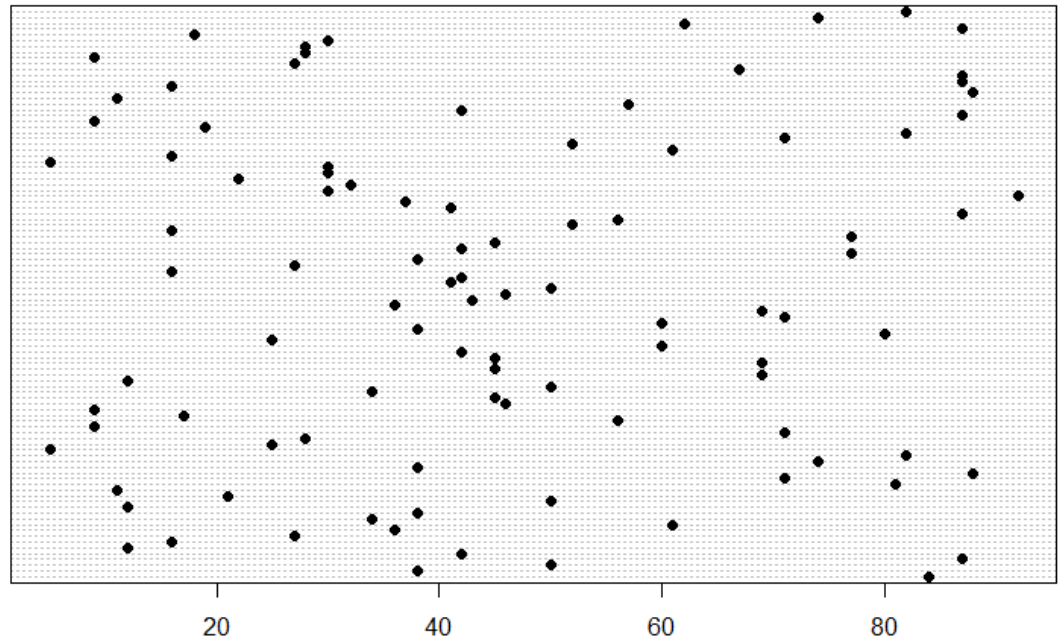


# 資料前處理

## 雜訊資料處理

### 2-1. 刪除法 : remove 例外點

```
1 rm(list=ls())
2 library(lattice)
3 library(MASS)
4 library(nnet)
5 library(mice)
6 library(DMwR)
7 library(outliers)
8
9 y=round(runif(100)*100)
10 print(y)
11 dotchart(y,col=ifelse(y==outlier(y),
12                       "red", "black"),pch=19)
13 rmd <- outlier(y)
14 yy <- y
15 yy <- yy[yy[-rmd]]
16 print(yy)
17 dotchart(yy,col=ifelse(yy==outlier(y),
18                       "red", "black"),pch=19)
```



# 資料前處理

## 雜訊資料處理

### 2-2. 等寬箱平均值光滑方法

```
1 rm(list=ls())
2 library(lattice)
3 library(MASS)
4 library(nnet)
5 library(mice)
6 library(DMwR)
7 library(outliers)
8
9 y=round(runif(100)*100)
10 print(y)
11 dotchart(y,col=ifelse(y==outlier(y),
12                       "red","black"),pch=19)
13 y <- sort(y)
14 dim(y)=c(10,10)
15 print(y)
16 y[,1] = apply(y,1,mean)[1]
17 y[,2] = apply(y,1,mean)[2]
18 y[,3] = apply(y,1,mean)[3]
19 y[,4] = apply(y,1,mean)[4]
20 y[,5] = apply(y,1,mean)[5]
21 y[,6] = apply(y,1,mean)[6]
22 y[,7] = apply(y,1,mean)[7]
23 y[,8] = apply(y,1,mean)[8]
24 y[,9] = apply(y,1,mean)[9]
25 y[,10] = apply(y,1,mean)[10]
26 print(y)
```

```
> y <- sort(y)
> dim(y)=c(10,10)
> print(y)
```

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]	[,10]
[1,]	3	8	16	31	41	52	64	77	81	90
[2,]	3	9	18	31	42	52	65	77	83	92
[3,]	3	10	21	32	42	54	66	79	84	95
[4,]	4	10	23	36	46	54	68	79	86	95
[5,]	4	12	25	38	48	55	69	79	86	97
[6,]	5	13	26	38	48	56	69	79	86	98
[7,]	6	15	26	39	49	57	69	79	87	98
[8,]	6	15	27	39	50	58	70	80	88	98
[9,]	7	15	28	39	50	61	72	80	90	98
[10,]	8	16	29	40	51	62	74	80	90	99

```
> y[,1] = apply(y,1,mean)[1]
> y[,2] = apply(y,1,mean)[2]
> y[,3] = apply(y,1,mean)[3]
> y[,4] = apply(y,1,mean)[4]
> y[,5] = apply(y,1,mean)[5]
> y[,6] = apply(y,1,mean)[6]
> y[,7] = apply(y,1,mean)[7]
> y[,8] = apply(y,1,mean)[8]
> y[,9] = apply(y,1,mean)[9]
> y[,10] = apply(y,1,mean)[10]
> print(y)
```

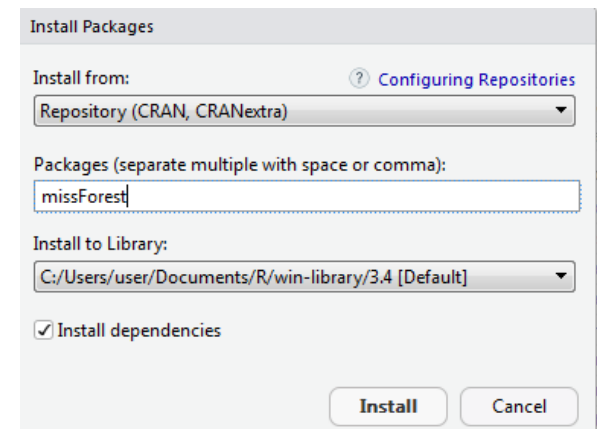
	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]	[,10]
[1,]	46.3	46.3	46.3	46.3	46.3	46.3	46.3	46.3	46.3	46.3
[2,]	47.2	47.2	47.2	47.2	47.2	47.2	47.2	47.2	47.2	47.2
[3,]	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6
[4,]	50.1	50.1	50.1	50.1	50.1	50.1	50.1	50.1	50.1	50.1
[5,]	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3
[6,]	51.8	51.8	51.8	51.8	51.8	51.8	51.8	51.8	51.8	51.8
[7,]	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5
[8,]	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1
[9,]	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
[10,]	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9

# 如何產生缺失資料

使用 prodNA 函數產生 15% IRIS data 的 miss value

```
1 rm(list=ls())
2 library(missForest)
3 library(DMwR)
4
5
6 iris_data <- prodNA(iris, noNA = 0.15)
7 head(iris_data)
```

```
> iris_data <- prodNA(iris, noNA = 0.15)
> head(iris_data)
  Sepal.Length Sepal.Width Petal.Length Petal.Width Species
1          5.1         3.5         1.4         0.2   setosa
2          4.9         3.0          NA          NA   setosa
3          4.7         3.2         1.3          NA   setosa
4          4.6         3.1         1.5         0.2   setosa
5          5.0          NA          NA         0.2    <NA>
6          5.4         3.9         1.7         0.4   setosa
>
```



# 隨堂練習 1

---

1. 利用平均方法來填補所有數值的 missing value
2. 利用最近鄰居方法 (KNN) 來填補所有的 missing value

hint: 需要安裝 DMwR 套件



# 資料前處理

## 資料整合

資料整合是將多個來源中的資料合併並儲存，整合前要先進行比對的動作 (ex t-test, 卡方檢定 `chisq.test`)

```
1 d1 <- round(runif(10)*100)
2 d2 <- round(runif(10)*100)
3
4 d <- cbind(d1,d2)
5 print(d)
6
7 test <- chisq.test(d1)
8 print(test)
9
10 test2 <- t.test(d1,d2)
11 print(test2)
```

```
> print(d)
      d1 d2
[1,] 24 29
[2,] 68 20
[3,]  8 57
[4,] 68 20
[5,] 14 51
[6,] 15 92
[7,] 61 15
[8,] 65 93
[9,] 90 85
[10,] 12 86
>
> test <- chisq.test(d1)
> print(test)

      Chi-squared test for given probabilities

data:  d1
X-squared = 198.51, df = 9, p-value < 2.2e-16

>
> test2 <- t.test(d1,d2)
> print(test2)

      Welch Two Sample t-test

data:  d1 and d2
t = -0.87324, df = 17.946, p-value = 0.3941
```

# 資料前處理

## 資料整合

資料整合是將多個來源中的資料合併並儲存，整合前要先進行比對的動作 (ex t-test, 卡方檢定 chisq.test)

```
1 d1 <- seq(1:10)
2 d2 <- seq(1:10)
3 d  <- cbind(d1,d2)
4 print(d)
5 test <- chisq.test(d)
6 print(test)
7
8 test2 <- t.test(d1,d2)
9 print(test2)
10 |
```

```
> print(d)
      d1 d2
[1,]  1  1
[2,]  2  2
[3,]  3  3
[4,]  4  4
[5,]  5  5
[6,]  6  6
[7,]  7  7
[8,]  8  8
[9,]  9  9
[10,] 10 10
> test <- chisq.test(d)
Warning message:
In chisq.test(d) : Chi-squared approximation may be incorrect
> print(test)

        Pearson's Chi-squared test

data:  d
X-squared = 0, df = 9, p-value = 1

>
> test2 <- t.test(d1,d2)
> print(test2)

        Welch Two Sample t-test

data:  d1 and d2
t = 0, df = 18, p-value = 1
```

# 資料前處理

## 資料整合

```
1 set.seed(50)
2 a1 <- round(runif(3)*5)
3 a2 <- round(runif(3)*5)
4 b1 <- runif(3)*1
5 b2 <- runif(3)*1
6 a <- c(a1,a2)
7 b <- c(b1,b2)
8 print(a)
9
10 dt <- cbind(a,b)
11 print(dt)
12
13 rept <- unique(dt[,1])
14 lens <- length(rept)
15 print(rept)
16
17 for(i in 1:lens)
18 {
19   if(length(which(dt[,1]==rept[i]))>=2)
20   {
21     x<-which(dt[,1]==rept[i])
22     break
23   }
24 }
25
26 dt <- dt[-x[2],]
27 print(dt)
```

```
> print(a)
[1] 4 2 1 4 3 0
>
> dt <- cbind(a,b)
> print(dt)
      a      b
[1,] 4 0.69991279
[2,] 2 0.64634362
[3,] 1 0.04202962
[4,] 4 0.10754123
[5,] 3 0.39055818
[6,] 0 0.26976581
```

```
> rept <- unique(dt[,1])
> lens <- length(rept)
> print(rept)
[1] 4 2 1 3 0
```

```
> for(i in 1:lens)
+ {
+   if(length(which(dt[,1]==rept[i]))>=2)
+   {
+     x<-which(dt[,1]==rept[i])
+     break
+   }
+ }
> dt <- dt[-x[2],]
> print(dt)
      a      b
[1,] 4 0.69991279
[2,] 2 0.64634362
[3,] 1 0.04202962
[4,] 3 0.39055818
[5,] 0 0.26976581
> |
```

# 資料前處理

## 資料轉換

資料整合是將資料轉換成接下來要探勘的樣式 ( 如之前介紹的光滑方法 )

現在用將 uci 資料集 (wine) 的正規化來當成另一個例子

<https://archive.ics.uci.edu/ml/datasets/wine>



### Wine Data Set

Download: [Data Folder](#), [Data Set Description](#)

Abstract: Using chemical analysis determine the origin of wines



Data Set Characteristics:	Multivariate	Number of Instances:	178	Area:	Physical
Attribute Characteristics:	Integer, Real	Number of Attributes:	13	Date Donated	1991-07-01
Associated Tasks:	Classification	Missing Values?	No	Number of Web Hits:	850710

# 資料前處理

## 資料轉換

現在用將 uci 資料集 (wine) 的正規化來當成另一個例子

<https://archive.ics.uci.edu/ml/datasets/wine>

```
1 wine_uci <- "https://archive.ics.uci.edu/ml
2 /machine-learning-databases/wine/wine.data"
3
4 wine_data <- read.table(wine_uci, header=TRUE, sep=",")
5
6 head(wine_data,10)
7
8 |
```

```
> head(wine_data,10)
```

	X1	X14.23	X1.71	X2.43	X15.6	X127	X2.8	X3.06	X.28	X2.29	X5.64	X1.04	X3.92	X1065
1	1	13.20	1.78	2.14	11.2	100	2.65	2.76	0.26	1.28	4.38	1.05	3.40	1050
2	1	13.16	2.36	2.67	18.6	101	2.80	3.24	0.30	2.81	5.68	1.03	3.17	1185
3	1	14.37	1.95	2.50	16.8	113	3.85	3.49	0.24	2.18	7.80	0.86	3.45	1480
4	1	13.24	2.59	2.87	21.0	118	2.80	2.69	0.39	1.82	4.32	1.04	2.93	735
5	1	14.20	1.76	2.45	15.2	112	3.27	3.39	0.34	1.97	6.75	1.05	2.85	1450
6	1	14.39	1.87	2.45	14.6	96	2.50	2.52	0.30	1.98	5.25	1.02	3.58	1290
7	1	14.06	2.15	2.61	17.6	121	2.60	2.51	0.31	1.25	5.05	1.06	3.58	1295
8	1	14.83	1.64	2.17	14.0	97	2.80	2.98	0.29	1.98	5.20	1.08	2.85	1045
9	1	13.86	1.35	2.27	16.0	98	2.98	3.15	0.22	1.85	7.22	1.01	3.55	1045
10	1	14.10	2.16	2.30	18.0	105	2.95	3.32	0.22	2.38	5.75	1.25	3.17	1510

# 資料前處理

## 資料轉換

### 正規化

```
1 rm(list=ls())
2 nor <- function(x){(x-min(x))/(max(x)-min(x))}
3
4 wine_uci <- "https://archive.ics.uci.edu/ml
5 /machine-learning-databases/wine/wine.data"
6
7 wine_data <- read.table(wine_uci, header=TRUE, sep =",")
8
9 print(wine_data[,14])
10 wine_data[,14] <- nor(wine_data[,14])
11
12 head(wine_data,10)|
```

```
> print(wine_data[,14])
[1] 1050 1185 1480 735 1450 1290
[22] 1035 1015 845 830 1195 1285
[43] 680 885 1080 1065 985 1060
```

```
> head(wine_data,10)
```

	X1	X14.23	X1.71	X2.43	X15.6	X127	X2.8	X3.06	X.28	X2.29	X5.64	X1.04	X3.92	X1065
1	1	13.20	1.78	2.14	11.2	100	2.65	2.76	0.26	1.28	4.38	1.05	3.40	0.5506419
2	1	13.16	2.36	2.67	18.6	101	2.80	3.24	0.30	2.81	5.68	1.03	3.17	0.6469330
3	1	14.37	1.95	2.50	16.8	113	3.85	3.49	0.24	2.18	7.80	0.86	3.45	0.8573466

# 隨堂練習 2

---

1. 讀取 IRIS data, Wine data

2. 將 IRIS 的資料集和 Wine data 合併

Hint: 將 IRIS 增加維度並補足 NA 的資料後再合併

Any Questions !?