105-2: EE4052

計算機程式設計

Computer Programming

Unit 08: 檔案資料輸入與輸出

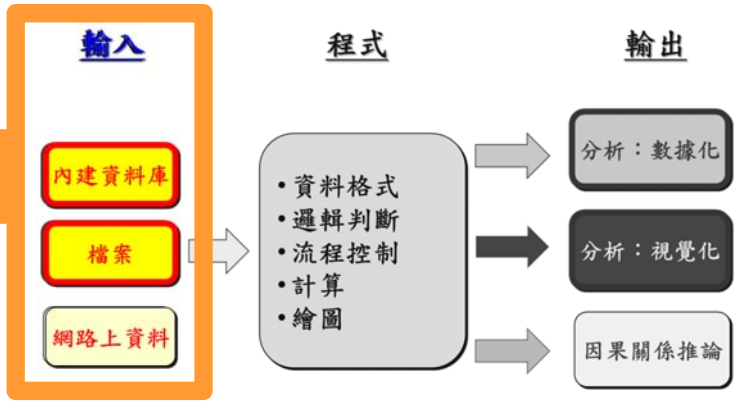
連 豐 力

臺 大 電 機 系

Feb 2017 - Jun 2017

課程主題進度

- U01: 課程介紹：討論主題，作業，報告，進行方式
- U02: 設定軟體 R 與 Rstudio
- U03: 數據處理與繪圖指令功能
- U04: 資料類別與基本運算
- U05: 邏輯判斷與流程控制
- U06: 函數：計算與排序
- U07: 多維度資料格式
- **U08: 檔案資料輸入與輸出**
- U09: 繪圖功能與文字
- U10: 多重繪圖與顏色
- U11: 函數：動畫與動作
- U12: 探索性資料分析
- U13: 資料前置處理
- U14: 資料連結分析



大綱

- 取得檔案的資料：輸入與輸出
- 取得內建資料庫
- 取得其他資料庫的資料
- 取得網頁的資料

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U08: 資料輸入與輸出
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檔案資料輸入與輸出

設定工作目錄

- rm(list = ls())
- ls()
- mywd <- "L:/DataWD"
- setwd(mywd)
- getwd( )

資料儲存 – dump, source

- # 儲存物件的名稱與其值（內容）
- x <- 1:10
- y <- matrix(1:6, nrow = 2, ncol = 3)
- ls()
- dump(c("x", "y"), file = "mydump.txt")
- rm(x); rm(y)
- ls()
- source(file = "mydump.txt")
- ls()

mydump.txt

```
x <-
1:10

y <-
structure(1:6, .Dim = 2:3)
```

資料儲存 – dput, dget

- # 儲存物件的值（內容）
- x <- 1:10
- y <- matrix(1:6, nrow = 2, ncol = 3)
- dput(y, file = "mydput.txt")
- newy <- dget("mydput.txt")
- newy

mydput.txt

```
structure(1:6, .Dim = 2:3)
```


資料儲存 – sink

- # 螢幕輸出轉到檔案
- sink("mysink.txt")
- x
- y
- sink( )
- x
- y

mysink.txt

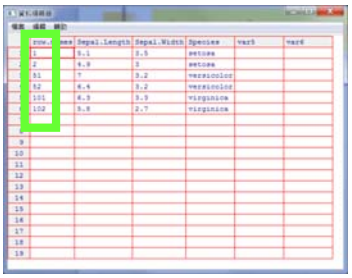
```
 [1]  1  2  3  4  5  6  7  8  9 10

     [,1] [,2] [,3]
[1,]    1    3    5
[2,]    2    4    6
```

資料儲存 – read.table, write.table

- dataf <- iris[c(1, 2, 51, 52, 101, 102), c(1, 2, 5)]
- dataf <- edit(dataf)
- write.table(dataf, "mydataf.txt")
- df <- read.table("mydataf.txt")

```
> dataf
    Sepal.Length Sepal.Width    Species
1            5.1         3.5     setosa
2            4.9         3.0     setosa
51           7.0         3.2 versicolor
52           6.4         3.2 versicolor
101          6.3         3.3  virginica
102          5.8         2.7  virginica
```



mydataf.txt

```
"Sepal.Length" "Sepal.Width" "Species"
"1" 5.1 3.5 "setosa"
"2" 4.9 3 "setosa"
"3" 7 3.2 "versicolor"
"4" 6.4 3.2 "versicolor"
"5" 6.3 3.3 "virginica"
"6" 5.8 2.7 "virginica"
```

```
> dataf
    Sepal.Length Sepal.Width    Species
1            5.1         3.5     setosa
2            4.9         3.0     setosa
3            7.0         3.2 versicolor
4            6.4         3.2 versicolor
5            6.3         3.3  virginica
6            5.8         2.7  virginica
```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資料儲存 – read.table, write.table

mydataf.txt

```
"Sepal.Length" "Sepal.Width" "Species"
"1" 5.1 3.5 "setosa"
"2" 4.9 3 "setosa"
"3" 7 3.2 "versicolor"
"4" 6.4 3.2 "versicolor"
"5" 6.3 3.3 "virginica"
"6" 5.8 2.7 "virginica"
```

- df <- read.table("mydataf.txt")
- sf0 <- read.table("mydataf0.txt") % 去掉 "" 的資料
- sf1 <- read.table("mydataf1.txt", header = FALSE)
  % 去掉標題的資料
- sf2 <- read.table("mydataf2.txt", header = TRUE, row.names = NULL)
  % 去掉列名稱的資料
- sf3 <- read.table("mydataf3.txt", header = FALSE, row.names = NULL)
  % 去掉標題與列名稱

mydataf0.txt

```
Sepal.Length Sepal.Width Species
1 5.1 3.5 setosa
2 4.9 3 setosa
3 7 3.2 versicolor
4 6.4 3.2 versicolor
5 6.3 3.3 virginica
6 5.8 2.7 virginica
```

mydataf1.txt

```
1 5.1 3.5 setosa
2 4.9 3 setosa
3 7 3.2 versicolor
4 6.4 3.2 versicolor
5 6.3 3.3 virginica
6 5.8 2.7 virginica
```

mydataf2.txt

```
Sepal.Length Sepal.Width Species
5.1 3.5 setosa
4.9 3 setosa
7 3.2 versicolor
6.4 3.2 versicolor
6.3 3.3 virginica
5.8 2.7 virginica
```

mydata3.txt

```
5.1 3.5 setosa
4.9 3 setosa
7 3.2 versicolor
6.4 3.2 versicolor
6.3 3.3 virginica
5.8 2.7 virginica
```

資料儲存 – read.table, read.csv

mydata2.csv

```
Sepal.Length,Sepal.Width,Species
5.1,3.5,setosa
4.9,3,setosa
7,3.2,versicolor
6.4,3.2,versicolor
6.3,3.3,virginica
5.8,2.7,virginica
```

- # csv: comma separated values
- read.table("mydataf2.csv")
- read.table("mydataf2.csv", header = TRUE)
- read.table("mydataf2.csv", header = TRUE, sep = ",")
- dt1 <- read.table("mydataf2.csv", sep = ",", header = TRUE)
- dt2 <- read.csv("mydataf2.csv")

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資料儲存 – read.table, read.csv

mydata2.csv

```
Sepal.Length,Sepal.Width,Species
5.1,3.5,setosa
4.9,3,setosa
7,3.2,versicolor
6.4,3.2,versicolor
6.3,3.3,virginica
5.8,2.7,virginica
```

```
> read.table( "mydataf2.csv" )
                          V1
1 Sepal.Length,Sepal.Width,Species
2                5.1,3.5,setosa
3                  4.9,3,setosa
4               7,3.2,versicolor
5             6.4,3.2,versicolor
6               6.3,3.3,virginica
7               5.8,2.7,virginica


> read.table( "mydataf2.csv", header = TRUE )

  Sepal.Length.Sepal.Width.Species
1                5.1,3.5,setosa
2                  4.9,3,setosa
3               7,3.2,versicolor
4             6.4,3.2,versicolor
5               6.3,3.3,virginica
6               5.8,2.7,virginica


> read.table( "mydataf2.csv", header = TRUE )

  Sepal.Length.Sepal.Width.Species
1                5.1,3.5,setosa
2                  4.9,3,setosa
3               7,3.2,versicolor
4             6.4,3.2,versicolor
5               6.3,3.3,virginica
6               5.8,2.7,virginica


> read.table( "mydataf2.csv", header = TRUE, sep = "," )

  Sepal.Length Sepal.Width    Species
1          5.1         3.5     setosa
2          4.9         3.0     setosa
3          7.0         3.2 versicolor
4          6.4         3.2 versicolor
5          6.3         3.3  virginica
6          5.8         2.7  virginica
```

```
> dt1 <- read.table( "mydataf2.csv", sep = ",", header = TRUE )

> dt1
  Sepal.Length Sepal.Width    Species
1          5.1         3.5     setosa
2          4.9         3.0     setosa
3          7.0         3.2 versicolor
4          6.4         3.2 versicolor
5          6.3         3.3  virginica
6          5.8         2.7  virginica


> dt2 <- read.csv( "mydataf2.csv" )

> dt2
  Sepal.Length Sepal.Width    Species
1          5.1         3.5     setosa
2          4.9         3.0     setosa
3          7.0         3.2 versicolor
4          6.4         3.2 versicolor
5          6.3         3.3  virginica
6          5.8         2.7  virginica
```

資料儲存 – read.table, read.csv

- # 設定不同的目錄
- tphdata <- read.table("L:/DataWD/Typhoon-01.txt", header = TRUE)
- tphdata

```
> tphdata

    x1    x2  x3 x4   d1    d2  d3
1  23.0 130.9 970  0 23.1 130.2 970
2  23.1 130.2 970  0 23.2 129.5 970
3  23.2 129.5 970  0 23.3 128.6 965
4  23.3 128.6 965  0 23.3 128.1 960
5  23.3 128.1 960  0 23.3 127.9 960
6  23.3 127.9 960  0 23.3 127.6 960
7  23.3 127.6 960  0 23.4 126.9 960
8  23.4 126.9 960  0 23.4 126.6 960
9  23.4 126.6 960  0 23.4 126.5 960
…
…
…
46 23.9 121.5 955  1 24.0 121.4 965
47 24.0 121.4 965  1 24.1 121.4 965
48 24.1 121.4 965  1 24.2 121.3 965
49 24.2 121.3 965  1 24.3 121.3 965
50 24.3 121.3 965  1 24.4 121.3 965
```


資料儲存 – scan

- # 讀取大量資料的文字檔
- scandata <- scan("scanlist.txt", list(Sepal.Length = 0, Sepal.Width = 0, Species = ""))

scanlist.txt

```
5.1 3.5 setosa
4.9 3.0 setosa
7.0 3.2 versicolor
6.4 3.2 versicolor
6.3 3.3 virginica
5.8 2.7 virginica
```

```
> scandata

$Sepal.Length
[1] 5.1 4.9 7.0 6.4 6.3 5.8

$Sepal.Width
[1] 3.5 3.0 3.2 3.2 3.3 2.7

$Species
[1] "setosa"     "setosa"     "versicolor"
[4] "versicolor" "virginica"  "virginica"
```

讀取資料 – Insurance 例子

```
# 讀取資料
Ins_c1 <- read.csv( "Insurance.csv" )
head( Ins_c1 )

Ins_c2 <- read.table( "Insurance.csv" )
head( Ins_c2 )

Ins_c3 <- read.table( "Insurance.csv", header = TRUE, sep="," )
head( Ins_c3 )

Ins_t1 <- read.table( "Insurance.txt" )
head( Ins_t1 )

Ins_t2 <- read.table( "Insurance.txt", header = TRUE, sep="" )
head( Ins_t2 )
```


資料儲存 – read.table, read.csv

	District	Group	Age	Holders	Claims
1	1	<1l	<25	197	38
2	1	<1l	25-29	264	35
3	1	<1l	30-35	246	20
4	1	<1l	>35	1680	156
5	1	1-1.5l	<25	284	63
6	1	1-1.5l	25-29	536	84
7	1	1-1.5l	30-35	696	89
8	1	1-1.5l	>35	3582	400
9	1	1.5-2l	<25	133	19
10	1	1.5-2l	25-29	286	52

```
> Ins_c1 <- read.csv( "Insurance.csv" )

> head( Ins_c1 )

  X District  Group   Age Holders Claims
1 1        1    <1l   <25     197     38
2 2        1    <1l 25-29     264     35
3 3        1    <1l 30-35     246     20
4 4        1    <1l   >35    1680    156
5 5        1 1-1.5l   <25     284     63
6 6        1 1-1.5l 25-29     536     84


> Ins_c2 <- read.table( "Insurance.csv" )

> head( Ins_c2 )

V1                                  V2
1 NA ,"District","Group","Age","Holders","Claims"
2  1                  ,"1","<1l","<25",197,38
3  2                ,"1","<1l","25-29",264,35
4  3                ,"1","<1l","30-35",246,20
5  4                ,"1","<1l",">35",1680,156
6  5              ,"1","1-1.5l","<25",284,63


> Ins_c3 <- read.table( "Insurance.csv", header = TRUE, sep="," )

> head( Ins_c3 )

  X District  Group   Age Holders Claims
1 1        1    <1l   <25     197     38
2 2        1    <1l 25-29     264     35
3 3        1    <1l 30-35     246     20
4 4        1    <1l   >35    1680    156
5 5        1 1-1.5l   <25     284     63
6 6        1 1-1.5l 25-29     536     84
```

```
> Ins_t1 <- read.table( "Insurance.txt" )

> head( Ins_t1 )

  District  Group   Age Holders Claims
1        1    <1l   <25     197     38
2        1    <1l 25-29     264     35
3        1    <1l 30-35     246     20
4        1    <1l   >35    1680    156
5        1 1-1.5l   <25     284     63
6        1 1-1.5l 25-29     536     84


> Ins_t2 <- read.table( "Insurance.txt", header = TRUE, sep="" )

> head( Ins_t2 )

  District  Group   Age Holders Claims
1        1    <1l   <25     197     38
2        1    <1l 25-29     264     35
3        1    <1l 30-35     246     20
4        1    <1l   >35    1680    156
5        1 1-1.5l   <25     284     63
6        1 1-1.5l 25-29     536     84
```

讀取資料 – 從其他檔案格式

- R Programming/Importing and exporting data
- https://en.wikibooks.org/wiki/R_Programming/Importing_and_exporting_data

- Getting Data From An Online Source
- https://www.r-bloggers.com/getting-data-from-an-online-source/

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內建資料庫

Datasets 資料集

- # R 內建資料集：datasets
- # 近百個資料集，涵蓋：醫學、自然、 社會、人體等資料

- data(package = "datasets")
- help(AirPassengers)
- ?AirPassengers
- AirPassengers % Monthly Airline Passenger Numbers 1949-1960
- summary(AirPassengers)

- data(package = .packages(all.available = TRUE))

- # CO2 Carbon Dioxide Uptake in Grass Plants
- # uspop Populations Recorded by the US Census
- # Titanic Survival of passengers on the Titanic
- # women Average Heights and Weights for American Women

Datasets 資料集

- # CO2 Carbon Dioxide Uptake in Grass Plants
- CO2
- summary(CO2)

- # uspop Populations Recorded by the US Census
- uspop
- summary(uspop)

- # Titanic Survival of passengers on the Titanic
- Titanic
- summary(Titanic)

- # women Average Heights and Weights for American Women
- women
- summary(women)

其他軟體套件的資料集

- # MASS
- library(MASS)
- data(Insurance)

- ?Insurance
- head(Insurance)
- tail(Insurance)
- dim(Insurance)
- names(Insurance)
- attributes(Insurance)

- class(Insurance$District)
- class(Insurance$Age)
- class(Insurance$Holders)
- levels(Insurance$Age)

```
> head( Insurance )
  District  Group   Age Holders Claims
1        1    <1l   <25     197     38
2        1    <1l 25-29     264     35
3        1    <1l 30-35     246     20
4        1    <1l   >35    1680    156
5        1 1-1.5l   <25     284     63
6        1 1-1.5l 25-29     536     84

> tail( Insurance )
   District  Group   Age Holders Claims
59        4 1.5-2l 30-35      68     16
60        4 1.5-2l   >35     344     63
61        4    >2l   <25       3      0
62        4    >2l 25-29      16      6
63        4    >2l 30-35      25      8
64        4    >2l   >35     114     33

> dim( Insurance )
[1] 64  5

> names( Insurance )
[1] "District" "Group"    "Age"      "Holders"  "Claims"

> attributes( Insurance )
$names
[1] "District" "Group"    "Age"      "Holders"  "Claims"

$class
[1] "data.frame"

$row.names
 [1]  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22
[23] 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44
[45] 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64

> class( Insurance$District )
[1] "factor"

> class( Insurance$Age )
[1] "ordered" "factor"

> class( Insurance$Holders )
[1] "integer"

> levels( Insurance$Age )
[1] "<25"   "25-29" "30-35" ">35"
```


其他軟體套件的資料集

- # arules 軟體套件中，Groceries 資料集

- install.packages("arules")
- library(arules)
- data(Groceries)

- ?Groceries

- Groceries[1:10]

```
> Groceries[1:10]

transactions in sparse format with
 10 transactions (rows) and
 169 items (columns)
```

- inspect(Groceries[1:10])
- # 10位消費者購物車中的商品

```
> inspect( Groceries[1:10] )

    items
[1]  {citrus fruit,
      semi-finished bread,
      margarine,
      ready soups}
[2]  {tropical fruit,
      yogurt,
      coffee}
[3]  {whole milk}
[4]  {pip fruit,
      yogurt,
      cream cheese ,
      meat spreads}
[5]  {other vegetables,
      whole milk,
      condensed milk,
      long life bakery product}
[6]  {whole milk,
      butter,
      yogurt,
      rice,
      abrasive cleaner}
[7]  {rolls/buns}
[8]  {other vegetables,
      UHT-milk,
      rolls/buns,
      bottled beer,
      liquor (appetizer)}
[9]  {pot plants}
[10] {whole milk,
      cereals}
```

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其他資料庫的資料

網路上的資料庫

- The R Datasets Package
  - https://stat.ethz.ch/R-manual/R-devel/library/datasets/html/00Index.html
- UC Irvine Machine Learning Repository
  - https://archive.ics.uci.edu/ml/datasets.html
- The Free Datasets at r-dir.com
  - http://r-dir.com/reference/datasets.html
- Rdatasets: An archive of datasets distributed with R
  - http://vincentarelbundock.github.io/Rdatasets
- Datasets in R packages (IAState)
  - http://www.public.iastate.edu/~hofmann/data_in_r_sortable.html

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網頁的資料

讀取資料 – 從網路的檔案

- Reading a CSV-file from an URL
- The number of police officers in Scotland over time
- http://www.quandl.com/api/v1/datasets/EUROSTAT/CRIM_PLCE_42.csv
- read.csv("http://www.quandl.com/api/v1/datasets/EUROSTAT/CRIM_PLCE_42.csv")

```
         Date Value
1  2010-12-31 17263
2  2009-12-31 17409
3  2008-12-31 17048
4  2007-12-31 16221
5  2006-12-31 16234
6  2005-12-31 16221
7  2004-12-31 16001
8  2003-12-31 15482
9  2002-12-31 15287
10 2001-12-31 15093
11 2000-12-31 14948
12 1999-12-31 14684
13 1998-12-31 14854
14 1997-12-31 15050
15 1996-12-31 14672
16 1995-12-31 14479
17 1994-12-31 14313
18 1993-12-31 14139"
```

讀取資料 – 從網路的檔案

- # 和訊網 萬科 股票的相關金融資料
- http://stockdata.stock.hexun.com/2008en/zxcwzb.aspX?stockid=000002&type=1&date=2013.06.30

- install.packages("XML")
- library(XML)

- url = "http://stockdata.stock.hexun.com/2008en/zxcwzb.aspX?stockid=000002&type=1&date=2013.06.30"
- tales1 = readHTMLTable(url)

- tales1

讀取資料 – 從網路的檔案
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```
> tales1

$`NULL`
      V1
1 Annual

$`NULL`
                                  Period End Date       June 30 2013      March 31 2013
1                                Operating  Income  41,390,345,567.72  13,999,905,876.13
2                                        Net Profit   4,556,304,906.89   1,613,904,228.33
3                                      Total Profit   7,133,412,305.51   2,394,885,503.42
4            Net Profit Excluding Extraordinary Items   4,536,753,831.66   1,615,472,700.40
5                                     Total Assets 432,241,960,220.85 417,894,248,034.75
6                               Shareholders' Equity  66,644,627,234.02  65,578,003,059.72
7            Net Cash Flows From Operating Activities  -9,792,399,309.57  -2,383,260,770.37
8                             Basic Earnings Per Share                0.41              0.15
9                         The Rate Of Return On Equity                6.84              2.46
10 Net Cash Flows From Operating Activities Per Share               -0.89             -0.22
11                          Net Assets Value Per Share                6.05              5.96
12                Net Assets Per Share After Adjusted                0.00              0.00
13   Foreign Financial Accounting Standard Net Profit                0.00              0.00
14                    EPS Excluding Extraordinary Items                0.41              0.15
15                                  Report Start Time         2013-01-01        2013-01-01
16                                    Report End Time         2013-06-30        2013-03-31

$`NULL`
                                  Period End Date   December 31 2016   December 31 2031   December 31 2014   December 31 2013
1                                Operating  Income 240,477,236,923.34 195,549,130,020.90 146,388,004,498.44 135,418,791,080.35
2                                        Net Profit  21,022,606,256.56  18,119,406,249.27  15,745,454,144.70  15,118,549,405.78
3                                      Total Profit  39,253,611,726.28  33,802,617,619.10  25,252,363,233.49  24,291,011,249.30
4            Net Profit Excluding Extraordinary Items  20,929,278,864.67  17,615,950,216.12  15,576,596,101.66  15,113,721,585.36
5                                     Total Assets 830,674,213,924.14 611,295,567,689.29 508,408,755,415.65 479,205,323,490.54
6                               Shareholders' Equity 113,444,766,722.65 100,183,517,822.33  88,164,569,909.35  76,895,983,339.70
7            Net Cash Flows From Operating Activities  39,566,129,021.69  16,046,020,691.50  41,724,819,113.36   1,923,868,889.89
8                             Basic Earnings Per Share              1.90               1.64               1.43               1.37
9                         The Rate Of Return On Equity             18.53              18.09              17.86              19.66
10 Net Cash Flows From Operating Activities Per Share              3.58               1.45               3.79               0.18
11                          Net Assets Value Per Share             10.28               9.08               7.99               6.98
12                Net Assets Per Share After Adjusted              0.00               0.00               0.00               0.00
13   Foreign Financial Accounting Standard Net Profit              0.00               0.00               0.00               0.00
14                    EPS Excluding Extraordinary Items              1.90               1.60               1.41               1.37
15                                  Report Start Time         2016-01-01         2015-01-01         2014-01-01         2013-01-01
16                                    Report End Time         2016-12-31         2015-12-31         2014-12-31         2013-12-31

$`NULL`
NULL
```

讀取資料 – 從網路的檔案

- # 和訊網 萬科 股票的相關金融資料
- ls()
- names(tales1)
- tales1[[1]]
- tales1[[2]]
- tales1[[3]]
- tales1[[4]]

- aa <- tales1[[2]]
- aa

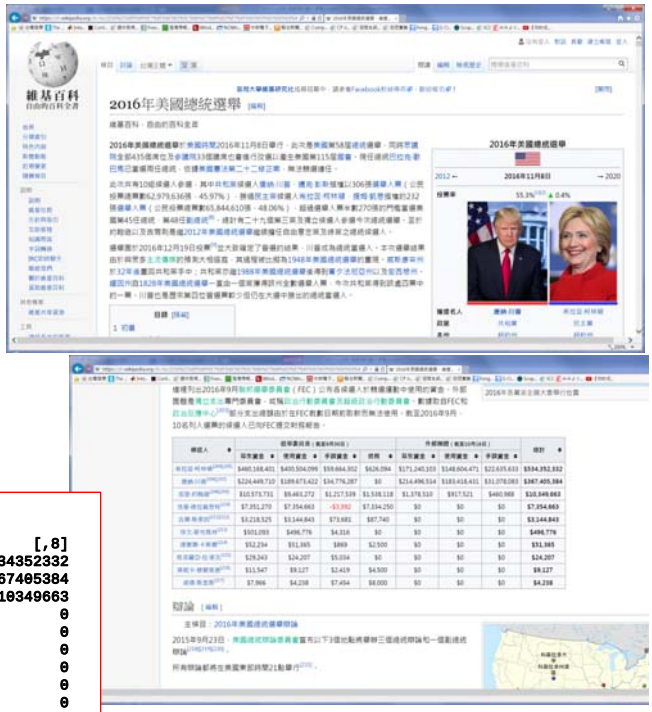
- class(aa)
- aa[1]
- aa[2]
- aa[3]

讀取資料 – 從網路的檔案

- # 2016年美國總統選舉 https://goo.gl/WEKw4I

- # load packages

- source("U08_2016USA.R")




```
> data.main.num

       [,1]      [,2]     [,3]    [,4]      [,5]      [,6]     [,7]      [,8]
 [1,] 460168401 400504099 59664302  626094 171240103 148604471 22635633 534352332
 [2,] 224449710 189673422 34776287       0 214496514 183418431 31078083 367405384
 [3,]  10573731   9463272  1217539 1538118   1378510    917521   460988  10349663
 [4,]         0         0        0       0         0         0        0         0
 [5,]         0         0        0       0         0         0        0         0
 [6,]         0         0        0       0         0         0        0         0
 [7,]         0         0        0       0         0         0        0         0
 [8,]         0         0        0       0         0         0        0         0
 [9,]         0         0        0       0         0         0        0         0
[10,]         0         0        0       0         0         0        0         0

>
```

大綱

作業

HW07：檔案資料輸入與輸出

On 4/25, 2017

- 假設您預計購買一個手機，
  從網路上找到一些手機的資料，
  如下表所示：

廠牌	Brand	Apple	HTC	HTC	ASUS	ASUS
型號	Model	iPhone7	OneM8	OneS9	ZenFoneDeluxe	ZenFoneZoom
價格（元）	Price	24500	21900	9990	8990	15990
螢幕（吋）	Screen	4.7	5	5	5.5	5.5
重量（克）	Weight	138	160	158	170	185
記憶體（GB）	GB	32	16	32	16	64
日期（年月日）	Date	20160916	20140328	20160617	20150827	20151201

- 這筆資料，已經整理成四個檔案：(請到課程網站下載到您的工作目錄)
  - HW07_Phone.txt, HW07_Phone.csv, HW07_Phone.web, HW07_Phone.html

HW07：檔案資料輸入與輸出

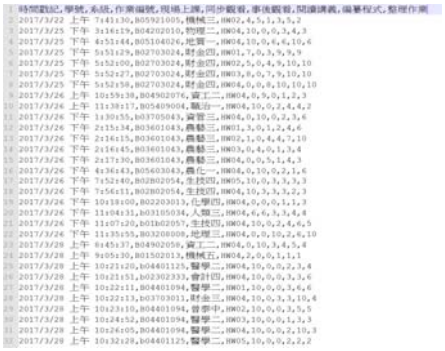
- 編輯一個程式於 .R 檔，完成下面的工作：
  - 用 read.table 取讀取 HW07_Phone.txt 中的資料，指定到：myPhoneTxt
  - 用 read.csv 取讀取 HW07_Phone.csv 中的資料，指定到：myPhoneCsv
  - 用 read.table 去取讀取下面網址的檔案，指定到：myPhoneWebTab
    https://goo.gl/XHtXw8
  - 用 read.csv 去取讀取下面網址的檔案，指定到：myPhoneWebCsv
    https://goo.gl/XHtXw8
  - 用 readLines( ) 去取讀取檔案，指定到：myPhoneHTML
  - 比較一下：myPhoneTxt，myPhoneCsv ，myPhoneWebTab 與 myPhoneWebCsv，myPhoneHTML，這幾個物件，看看：內容是否相同？格式是否相同？
  - 如果不同，可否重新讀入（例如：設定不同的參數），
    或者重新指定到新的物件，使得這四個的內容與格式都相同。
  - 請利用讀進來的數據，建立一個 5x3 的矩陣 (matrix)：Number，放置五個手機的價格，螢幕，重量三種資料。
- 把執行的過程，以及產生的數據等，整理到報告檔 (pdf or pptx)。

HW07：檔案資料輸入與輸出

- 繳交下面檔案，檔案名稱：HW07_學號_關鍵字.xxx
  - 主要指定檔案： HW07_B01921001_ReadData.R
  - 報告檔案： HW07_B01921001_ReadData.pdf 或者 .pptx
  - 或者是：R Markdown 等整合式的檔案，.Rmd 與 .pdf
    - 有關 R Markdown 的使用方式，可以參考下面說明：
    - http://rmarkdown.rstudio.com/lesson-1.html
    - http://rmarkdown.rstudio.com/articles_intro.html
- 繳交方式與期限：
  - E-mail 上面兩個檔案到：ntucp105s@gmail.com
  - E-mail 主旨：HW07_B01921001_ReadData
    (就是，作業編號_您的學號_關鍵字)
  - 繳交期限：4/30 (Sun), 2017, 11pm 以前
- 學習方式：請至下面網址輸入此次的學習方式所花的時間：
  - https://goo.gl/L157kQ

HW07：加分題

- 課程學習時間資料分析



- 2016年美國總統選舉

HW07：加分題

- 繳交下面檔案，檔案名稱：HWPlus_學號_關鍵字.xxx
  - 主要指定檔案： HWPlus_B01921001_LearnTime.R
  - 報告檔案： HWPlus_B01921001_LearnTime.pdf 或者 .pptx
  - 主要指定檔案： HWPlus_B01921001_USA2016.R
  - 報告檔案： HWPlus_B01921001_USA2016.pdf 或者 .pptx
  - 或者是：R Markdown 等整合式的檔案，.Rmd 與 .pdf
- 繳交方式與期限：
  - E-mail 上面兩個檔案到：ntucp105s@gmail.com
  - E-mail 主旨：HWPlus_B01921001_LearnTime
    or HWPlus_B01921001_USA2016
    (就是，作業編號_您的學號_關鍵字)
  - 繳交期限：無