


Chapter 2

START TO R

下載並安裝 R

1. Google R



[全部](#) [圖片](#) [影片](#) [新聞](#) [書籍](#) [更多](#) [設定](#) [工具](#)

約有 35,700,000 項結果 (搜尋時間：0.35 秒)

R: The R Project for Statistical Computing
<https://www.r-project.org/> [▼ 翻譯這個網頁](#)
The R Project for Statistical Computing. Getting Started. R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS. To download R, please choose your preferred CRAN mirror. If you have questions about R like how to download ...
[R: What is R?](#) · [R: R Foundation Membership](#) · [Windows](#) · [The R Foundation](#)
您已造訪這個網頁 4 次。上次造訪日期：2018/2/4

其他人也搜尋了以下項目

[https cran r project org mirrors html](#)

[r 3.1.2 tar gz](#)

[r tutorial](#)


[comprehensive r archive network](#)

[r for mac](#)

[rr studio](#)

R語言

程式語言



R語言，一種自由軟體程式語言與操作環境，主要用於統計分析、繪圖、資料探勘。R本來是由來自紐西蘭奧克蘭大學的羅斯·伊哈卡和羅伯特·傑特曼開發，現在由「R開發核心團隊」負責開發。R基於S語言的一個GNU計劃專案，所以也可以當作S語言的一種實現，通常用S語言編寫的代碼都可以不作修改的在R環境下執行。[維基百科](#)

下載並安裝 R

2. 滑鼠移到 download R (找到 Taiwan 的伺服器)



[\[Home\]](#)

Download

[CRAN](#)

The R Project for Statistical Computing

Getting Started

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS. To **download R**, please choose your preferred [CRAN mirror](#).

Taiwan

<https://ftp.yzu.edu.tw/CRAN/>

<http://ftp.yzu.edu.tw/CRAN/>

<http://cran.csie.ntu.edu.tw/>

Department of Computer Science and Engineering, Yuan Ze University
Department of Computer Science and Engineering, Yuan Ze University
National Taiwan University, Taipei

下載並安裝 R

3. 下載 windows (base) 版本

Linux / Mac OSX 請自選

Download and Install R

Precompiled binary distributions of the base system and contributed packages

- [Download R for Linux](#)
- [Download R for \(Mac\) OS X](#)
- [Download R for Windows](#)

If R is part of many Linux distributions, you should check with your

Subdirectories:

[base](#)

[contrib](#)

[old contrib](#)

[Rtools](#)

Binaries for base distribution. This is what you want to **install R for the first time**.

Binaries of contributed CRAN packages (for R \geq 2.13.x; managed by Uwe Ligges).
services and corresponding environment and make variables.

Binaries of contributed CRAN packages for outdated versions of R (for R $<$ 2.13.x; m

Tools to build R and R packages. This is what you want to build your own packages c

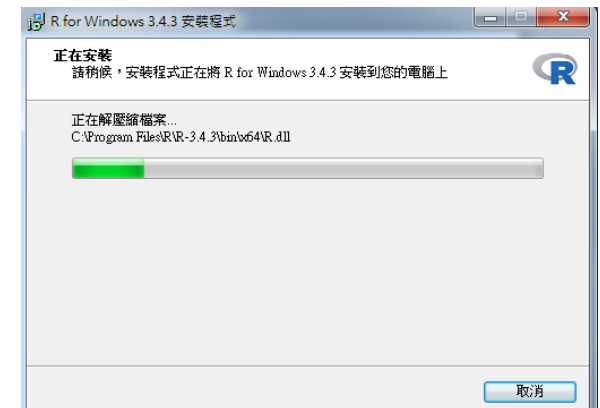
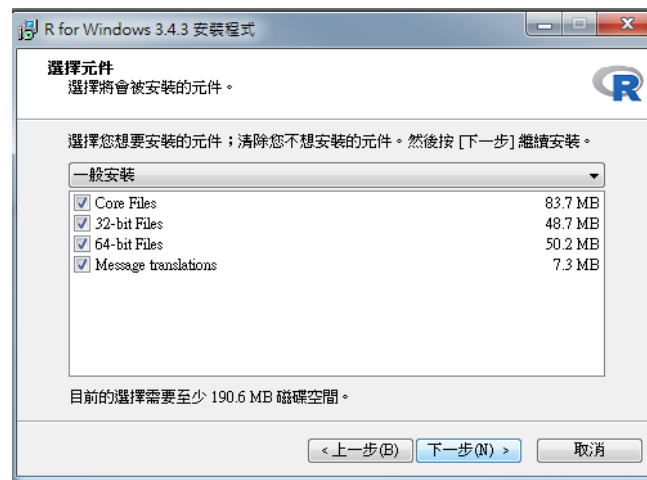
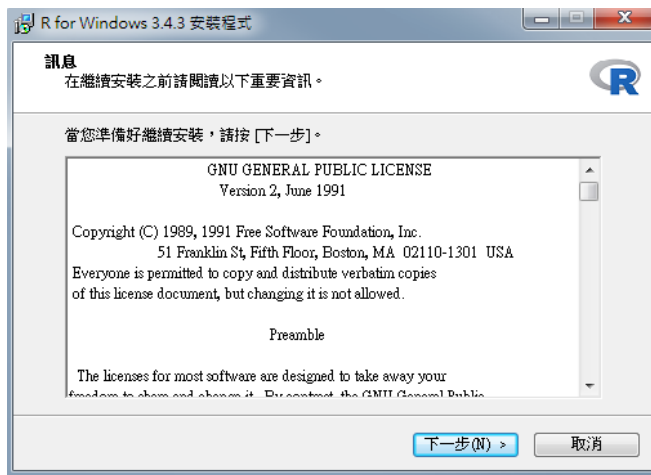
[Download R 3.4.3 for Windows](#) (62 megabytes, 32/64 bit)

[Installation and other instructions](#)

[New features in this version](#)

下載並安裝 R

4. 下一步 Repeat

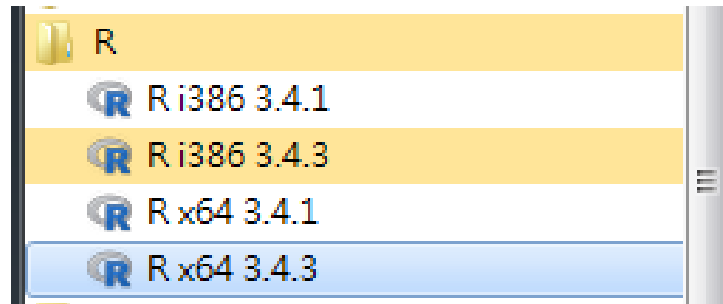


Hello R

1. 開始 -> 所有程式 -> R

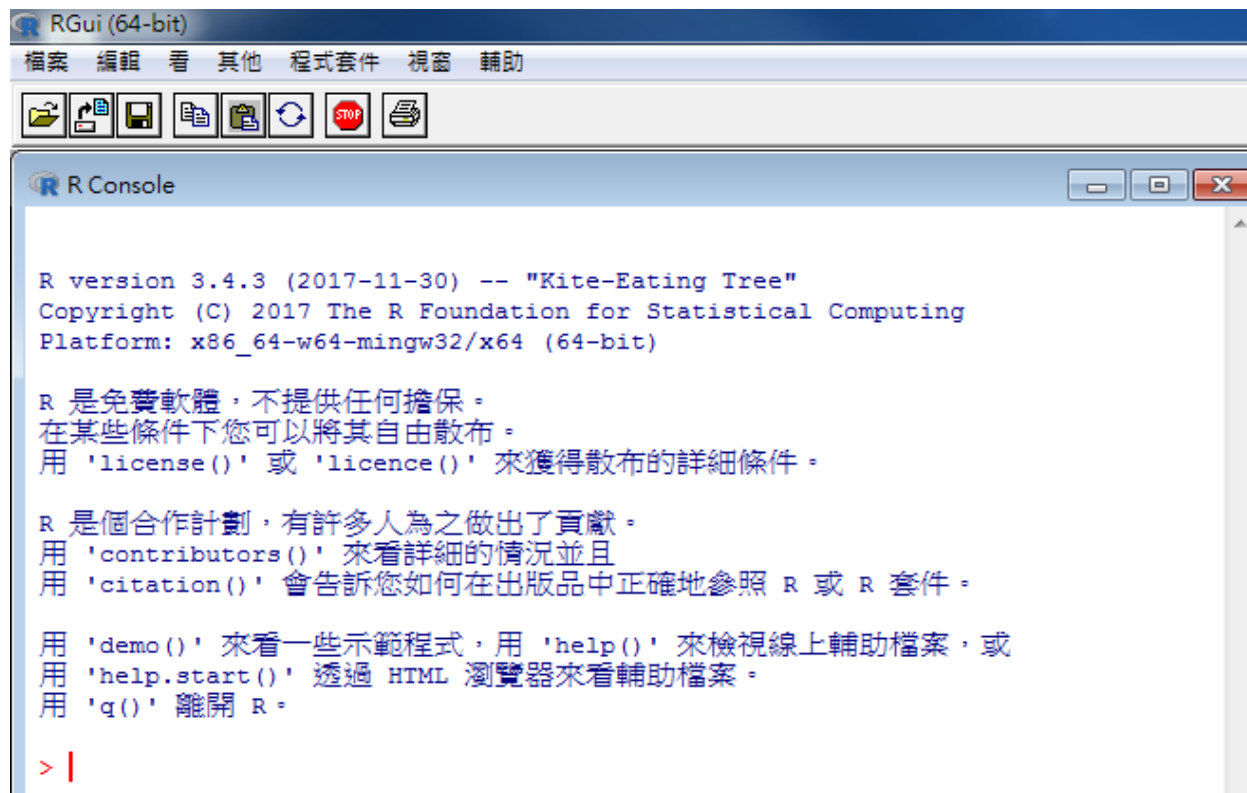
32bit -> i386 3.4.3

64bit -> x64 3.4.3



Hello R

2. 開始 -> 所有程式 -> R



RGui (64-bit)

檔案 編輯 視 其他 程式套件 視窗 輔助

R Console

```
R version 3.4.3 (2017-11-30) -- "Kite-Eating Tree"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R 是免費軟體，不提供任何擔保。
在某些條件下您可以將其自由散布。
用 'license()' 或 'licence()' 來獲得散布的詳細條件。

R 是個合作計劃，有許多人為之做出了貢獻。
用 'contributors()' 來看詳細的情況並且
用 'citation()' 會告訴您如何在出版品中正確地參照 R 或 R 套件。

用 'demo()' 來看一些示範程式，用 'help()' 來檢視線上輔助檔案，或
用 'help.start()' 透過 HTML 瀏覽器來看輔助檔案。
用 'q()' 離開 R =
```

> |

Hello R

3. 開啟新檔 輸入 `print("Hello")`, 存檔後按下 `ctrl + F5` (執行)



```
C:\Users\user\Documents\test.R - R 編輯器  
print("Hello")
```

```
> print("Hello")  
[1] "Hello"  
> |
```


介紹一個好東西 RStudio



下載並安裝 RStudio

1. Google RStudio

RStudio – Open source and enterprise-ready professional software for R

<https://www.rstudio.com/> ▼ 翻譯這個網頁

RStudio is an active member of the R community. We believe free and open source data analysis software is a foundation for innovative and important work in science, education, and industry. The many customers who value our professional software capabilities help us contribute to this community. Waze. GeoCF. EDF.

來自 [rstudio.com](https://www.rstudio.com/) 的搜尋結果

Download

Choose Your Version of RStudio.
RStudio is a set of integrated ...

Hosting and deployment

Shiny Server - Help - Shinyapps.io -
...

RStudio::conf

All of the 2018 conference materials
can be found on our ...

Frequently Asked Questions

Frequently asked questions about
RStudio's different products.

RStudio Desktop

RStudio Desktop. Commercial
License. RStudio Server. Open ...

R Packages

The RStudio team contributes code to
many R packages and ...



RStudio

軟體

RStudio是R語言的一種集成開發環境，它是免費自由軟體。RStudio同時有桌面版和伺服器版。RStudio基於C++開發，它的圖形用戶介面基於Qt。
[維基百科](#)

編寫語言： [Java](#)， [C++](#)， [JavaScript](#)

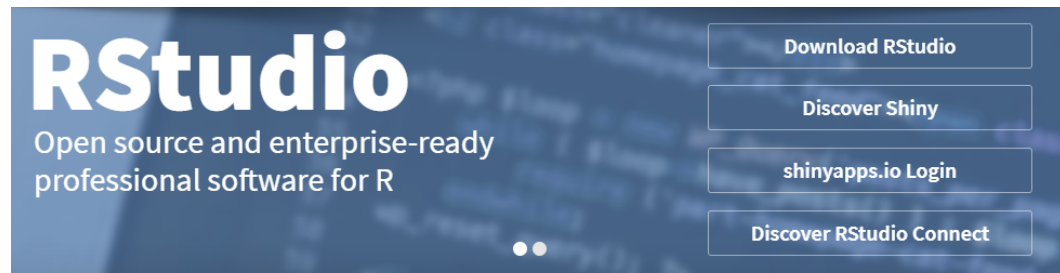
其他人也搜尋了：

查看更多項目 (超過 10 項)

 [ggplot2](#)  [Knitr](#)  [Biocondu...](#)  [SPSS](#)  [Anaconda](#)

下載並安裝 RStudio

2. 滑鼠移到 Download



RStudio

RStudio makes R easier to use. It includes a code editor, debugging & visualization tools.

[Download](#) [Learn More](#)



Shiny

Shiny helps you make interactive web applications for visualizing data. Bring R data analysis to life.

[Learn More](#)



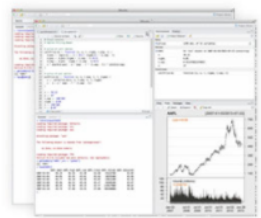
R Packages

Our developers create popular packages to expand the features of R. Includes ggplot2, dplyr, R Markdown & more.

[Learn More](#)

下載並安裝 RStudio

3. 有五種版本 選 Desktop Free 就好



Choose Your Version of RStudio

RStudio is a set of integrated tools designed to help you be more productive with R. It includes a console, syntax-highlighting editor that supports direct code execution, and a variety of robust tools for plotting, viewing history, debugging and managing your workspace. [Learn More about RStudio features.](#)

RStudio Desktop Open Source License	RStudio Desktop Commercial License	RStudio Server Open Source License	RStudio Server Pro Commercial License	RStudio Server Pro + RStudio Connect Commercial License
FREE	\$995 per year	FREE	\$9,995 per year	\$29,995 per year
DOWNLOAD Learn More	BUY Learn More	DOWNLOAD Learn More	DOWNLOAD Learn More	TALK Learn More
Integrated Tools for R				



RStudio Desktop 1.1.423 — Release Notes

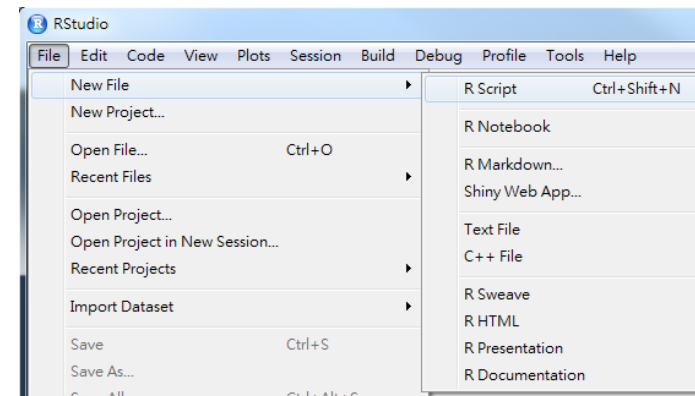
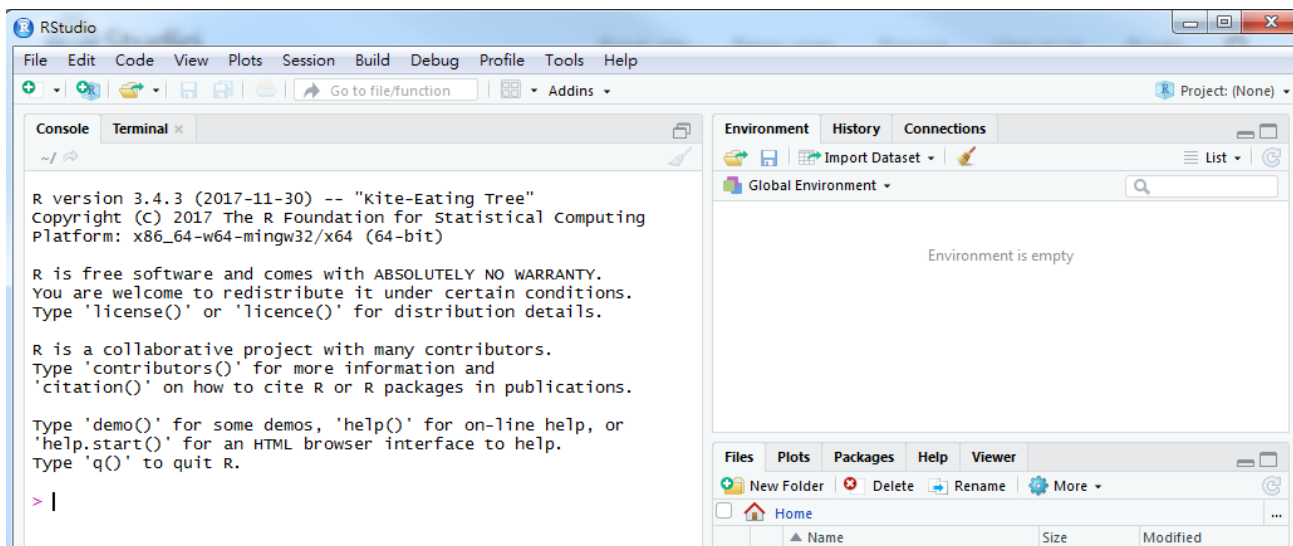
RStudio requires R 3.0.1+. If you don't already have R,

Installers for Supported Platforms

Installers
[RStudio 1.1.423 - Windows Vista/7/8/10](#)

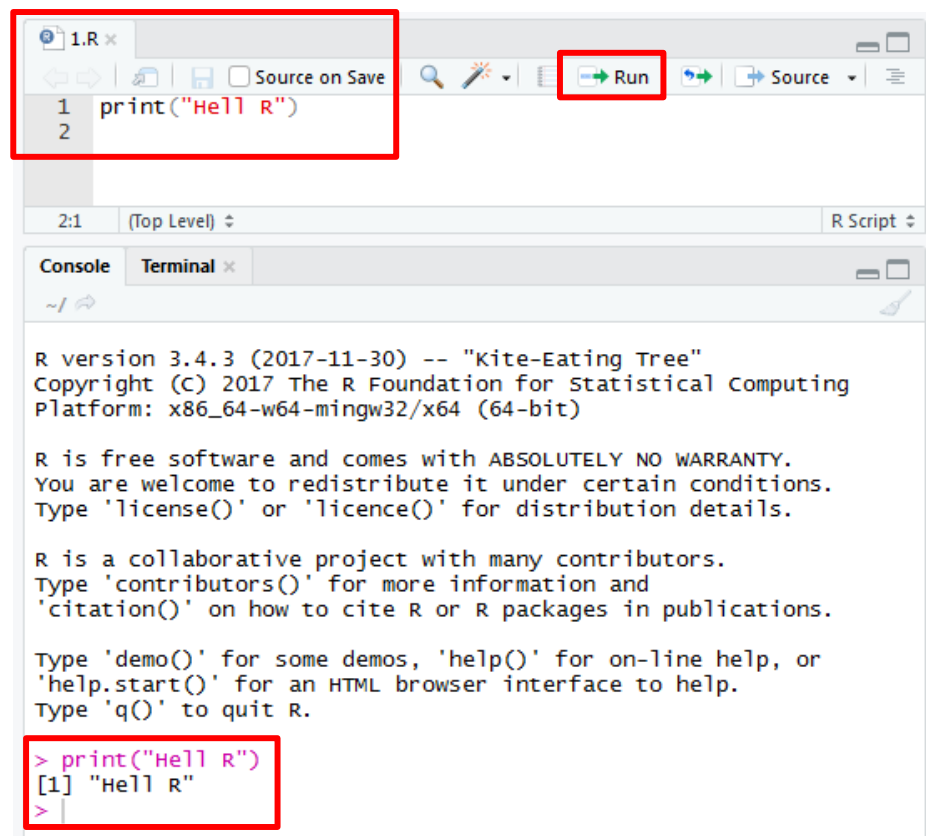
如何在 RStudio 上執行 R

1. 打 Rstudio, 選 R Script



如何在 RStudio 上執行 R

2. 輸入 `print("Hello R")` 存檔後並執行



如何在 RStudio 上執行 R

3. 若要執行多行程式 選擇要執行的程式 點選執行或 Ctrl+ Enter

```
1 print("Hello R")
2 print("Hello Data Mining")
3 print("Hello NKUST")
```

```
> print("Hello R")
[1] "Hello R"
> print("Hello Data Mining")
[1] "Hello Data Mining"
> print("Hello NKUST")
[1] "Hello NKUST"
> |
```

如何在 RStudio 上執行 R

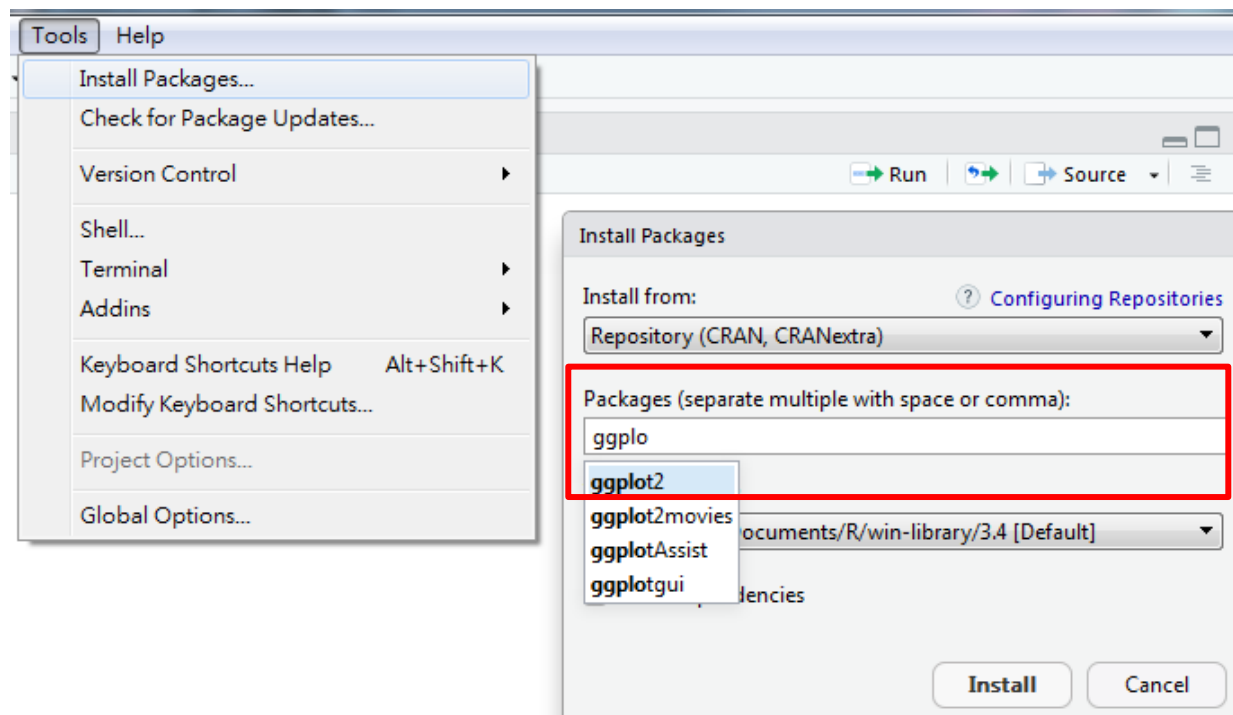
4. 若要執行某一行程式 把滑鼠指向該行程式並執行

```
1 print("Hello R")  
2 print("Hello Data Mining")  
3 print("Hello NKUST")
```

```
> print("Hello Data Mining")  
[1] "Hello Data Mining"
```


如何在 RStudio 安裝套件

1. Tool -> Install Packages -> 輸入套件名稱 (ex. ggplot2)



如何在 RStudio 安裝套件

2. 在 Console 會看到 相關的套件會一併安裝

```
> install.packages("ggplot2")
Installing package into 'C:/Users/user/Documents/R/win-library/3.4'
(as 'lib' is unspecified)
also installing the dependencies 'colorspace', 'assertthat', 'utf8', 'Rcpp', 'RColorBrewer', 'dichromat', 'munsell', 'labeling', 'R6', 'viridisLite', 'cli', 'crayon', 'pillar', 'rlang', 'digest', 'gtable', 'plyr', 'reshape2', 'scales', 'tibble', 'lazyeval'
```

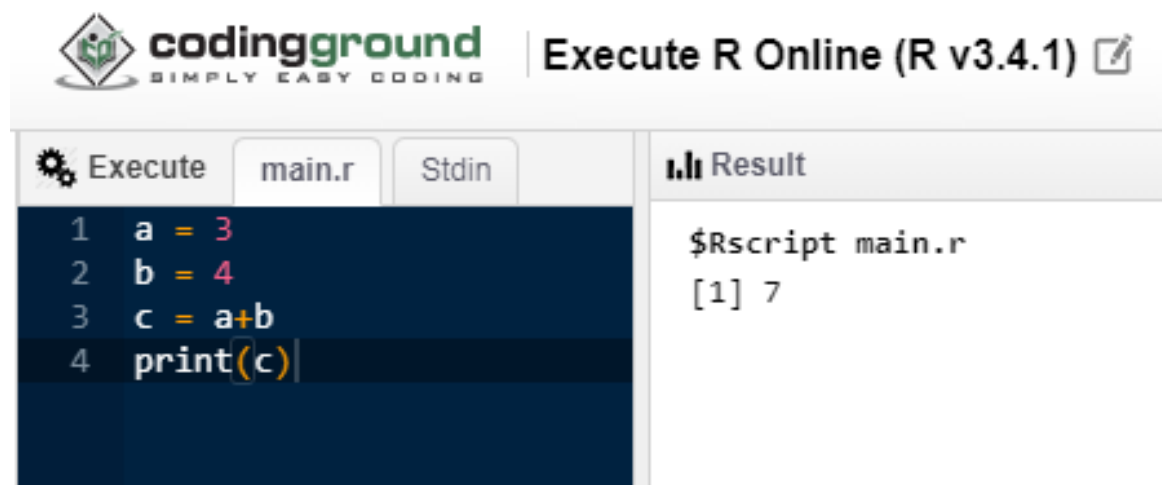
```
trying URL 'https://cran.rstudio.com/bin/windows/contrib/3.4/colorspace_1.3-2.zip'
Content type 'application/zip' length 447069 bytes (436 KB)
downloaded 436 KB
```

```
package 'colorspace' successfully unpacked and MD5 sums checked
package 'assertthat' successfully unpacked and MD5 sums checked
package 'utf8' successfully unpacked and MD5 sums checked
package 'Rcpp' successfully unpacked and MD5 sums checked
package 'RColorBrewer' successfully unpacked and MD5 sums checked
package 'dichromat' successfully unpacked and MD5 sums checked
package 'munsell' successfully unpacked and MD5 sums checked
package 'labeling' successfully unpacked and MD5 sums checked
package 'R6' successfully unpacked and MD5 sums checked
package 'viridisLite' successfully unpacked and MD5 sums checked
package 'cli' successfully unpacked and MD5 sums checked
package 'crayon' successfully unpacked and MD5 sums checked
package 'pillar' successfully unpacked and MD5 sums checked
package 'rlang' successfully unpacked and MD5 sums checked
package 'digest' successfully unpacked and MD5 sums checked
package 'gtable' successfully unpacked and MD5 sums checked
package 'plyr' successfully unpacked and MD5 sums checked
package 'reshape2' successfully unpacked and MD5 sums checked
package 'scales' successfully unpacked and MD5 sums checked
package 'tibble' successfully unpacked and MD5 sums checked
package 'lazyeval' successfully unpacked and MD5 sums checked
package 'ggplot2' successfully unpacked and MD5 sums checked
```

```
The downloaded binary packages are in
  C:\Users\user\AppData\Local\Temp\RtmpC4QnI1\downloaded_packages
```

線上編輯器

Codingground (http://www.compileonline.com/execute_r_online.php)



The screenshot shows the Codingground online R editor interface. At the top, there is a logo for 'codingground' with the tagline 'SIMPLY EASY CODING'. To the right of the logo, it says 'Execute R Online (R v3.4.1)' with a small icon of a notepad and pencil. Below this, there is a tabbed interface with three tabs: 'Execute' (with a gear icon), 'main.r', and 'Stdin'. The 'main.r' tab is active, showing a code editor with the following R code:

```
1 a = 3
2 b = 4
3 c = a+b
4 print(c)
```

To the right of the code editor, there is a 'Result' tab (with a bar chart icon) showing the output of the R script:

```
$Rscript main.r
[1] 7
```

Any Questions !?

資料型態

數值型別 (numeric Type)

型態	Example
數值	2
整數	3L
布林	TRUE
文字	"Stephen Curry"
日期	Sys.Date()
時間	Sys.time()

```
1 a <- 3
2 b <- 3L
3 c <- TRUE
4 d <- "Stephen Curry"
5 e <- Sys.Date()
6 f <- Sys.time()
7 print(a)
8 print(b)
9 print(c)
10 print(d)
11 print(e)
12 print(f)
13
```

```
Console Terminal x
~/
> a <- 3
> b <- 3L
> c <- TRUE
> d <- "Stephen Curry"
> e <- Sys.Date()
> f <- Sys.time()
> print(a)
[1] 3
> print(b)
[1] 3
> print(c)
[1] TRUE
> print(d)
[1] "Stephen Curry"
> print(e)
[1] "2018-02-21"
> print(f)
[1] "2018-02-21 11:26:38 CST"
> |
```

資料型態

數值型別 (numeric Type) – 查詢型態 : class

型態	Example
數值	2
整數	3L
布林	TRUE
文字	"Stephen Curry"
日期	Sys.Date()
時間	Sys.time()

```
1 a <- 3
2 b <- 3L
3 c <- TRUE
4 d <- "Stephen Curry"
5 e <- Sys.Date()
6 f <- Sys.time()
7 print(class(a))
8 print(class(b))
9 print(class(c))
10 print(class(d))
11 print(class(e))
12 print(class(f))
13
```

```
Console Terminal x
~/
> a <- 3
> b <- 3L
> c <- TRUE
> d <- "Stephen Curry"
> e <- Sys.Date()
> f <- Sys.time()
> print(class(a))
[1] "numeric"
> print(class(b))
[1] "integer"
> print(class(c))
[1] "logical"
> print(class(d))
[1] "character"
> print(class(e))
[1] "Date"
> print(class(f))
[1] "POSIXct" "POSIXt"
>
```

賦值 : assign

R 語言裡，賦值指令是「<-」，後面放變數數值，也可以使用“=”

```
Iverson <- 3  
Iverson = 3
```

```
1 Iverson <- 3  
2 AI = 3  
3  
4 print(Iverson)  
5 print(AI)
```

```
> Iverson <- 3  
> AI = 3  
>  
> print(Iverson)  
[1] 3  
> print(AI)  
[1] 3  
>
```

數學運算

符號	meaning
+ - * /	
^, **	次方
%%	餘數

```
1 a <- 8
2 b <- 7
3 c = a+b
4 d = a**b
5 e = a^b
6 f = d %% b
7
8 print (c)
9 print (d)
10 print (e)
11 print (f)
12
```

```
Console Terminal x
~/
> a <- 8
> b <- 7
> c = a+b
> d = a**b
> e = a^b
> f = d %% b
>
> print (c)
[1] 15
> print (d)
[1] 2097152
> print (e)
[1] 2097152
> print (f)
[1] 1
> |
```


日期轉換

R 語言裡，日期可以轉成整數

預設以 1970 年 1 月 1 日做為 0. 在這之後的日期 +1, 反之則 -1

```
1 date = Sys.Date()
2 int_date = as.integer(date)
3 print(int_date)
4 y = int_date / 365
5 d = int_date %% 365
6
7 print(y)
8 print(d)
```

```
> date = Sys.Date()
> int_date = as.integer(date)
> print(int_date)
[1] 17583
> y = int_date / 365
> d = int_date %% 365
>
> print(y)
[1] 48.1726
> print(d)
[1] 63
> |
```

日期轉換

R 語言裡，日期可以轉成整數

預設以 1970 年 1 月 1 日做為 0. 在這之後的日期 +1, 反之則 -1

```
1 date <- as.Date("1984-05-30")
2
3 x <- date +1
4 y <- date +2
5
6 print(x)
7 print(y)
8 |
```

```
> date <- as.Date("1984-05-30")
>
> x <- date +1
> y <- date +2
>
> print(x)
[1] "1984-05-31"
> print(y)
[1] "1984-06-01"
>
```

時間轉換

R 語言裡，時間也可以轉成整數

預設以 1970 年 1 月 1 日 00 時 00 分 001 秒做為 0. 在這之後的每秒 +1, 反之則 -1

```
1 times <- Sys.time()
2 print (as.integer(times))
3
4 times <- as.POSIXct("2018-02-21 13:33:00", tz= "GMT")
5 x <- times + 10
6 y <- times + 148000000
7 print(x)
8 print(y)
9
```

```
> times <- as.POSIXct("2018-02-21 13:33:00", tz= "GMT")
> x <- times + 10
> y <- times + 148000000
> print(x)
[1] "2018-02-21 13:33:10 GMT"
> print(y)
[1] "2022-10-31 12:39:40 GMT"
> |
```

變數判斷

R 語言裡，可以使用內建函數判斷變數是否為某種資料形態

函數	Meaning
is.numeric	是否為數值
is.integer	是否為整數
is.logical	是否為布林
is.character()	是否為文字
inherits(x, what = "Date")	是否為日期
inherits(x, what = "POSIXct")	是否為時間

變數判斷

R 語言裡，可以使用內建函數判斷變數是否為某種資料形態

```
1 is.numeric(1)
2 is.integer(3.5L)
3 is.integer(5L)
4 is.logical("false")
5 is.character(30)
6 inherits("2018-02-30", what = "Date")
7 inherits(sys.time(), what = "POSIXct")
```

```
Console Terminal x
~/
> is.numeric(1)
[1] TRUE
> is.integer(3.5L)
[1] FALSE
warning message:
integer literal 3.5L contains decimal; using numeric value
> is.integer(5L)
[1] TRUE
> is.logical("false")
[1] FALSE
> is.character(30)
[1] FALSE
> inherits("2018-02-30", what = "Date")
[1] FALSE
> inherits(sys.time(), what = "POSIXct")
[1] TRUE
> |
```

變數轉換

R 語言裡，可以使用 `as.類別名稱()` 進行某種資料形態的轉換

函數	Meaning
<code>as.numeric</code>	轉為數值
<code>as.integer</code>	轉為整數
<code>as.logical</code>	轉為布林
<code>as.character()</code>	轉為文字
<code>as.Date()</code>	轉為日期
<code>as.POSIXct()</code>	轉為時間

變數轉換

R 語言裡，可以使用 `as.` 類別名稱 () 進行某種資料形態的轉換

```
1 as.numeric("Curry")
2 as.integer(350.5)
3 as.logical(1L)
4 as.character(87)
5 as.Date("2018-02-14")
6 as.POSIXct(sys.time())
```

```
Console Terminal x
~/
> as.numeric("Curry")
[1] NA
Warning message:
NAs introduced by coercion
> as.integer(350.5)
[1] 350
> as.logical(1L)
[1] TRUE
> as.character(87)
[1] "87"
> as.Date("2018-02-14")
[1] "2018-02-14"
> as.POSIXct(sys.time())
[1] "2018-02-21 14:18:47 CST"
>
```

隨堂練習

1. 將身高，體重 assign 給 二個變數
2. 算出 BMI

```
> print(bmi)
[1] 29.38776
> |
```


隨堂練習

1. 1999 年 9 月 21 日 1 時 47 分 16 秒發生了 921 地震
2. 2018 年 2 月 6 日 23 時 50 分 42 秒發生了花蓮地震
3. 算出這二個地震的時間間隔多久

```
18 年 22 小時 3 分 26 秒  
> |
```

Hint：使用 `cat` 函數來串接字串

Any Questions !?