The R Project for Statistical Computing

R Language quick start

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https://ce.nctu.edu.tw/member/teachers/23

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選擇R的理由?

統計軟體:

- SAS (Statistical Analysis System), 1976創立，適合專業人員，支援作業系統Windows、Linux ($)
- SPSS (Statistical Package for the Social Science), 1975年創立，用FORTRAN語言編寫，支援作業系統Windows、macOS ($)
- Minitab, 1972創立，支援作業系統Windows、macOS, 2001 ($)
- EXCEL ($)
- S-PLUS, 商用軟體 ($)

選擇R的理由? 免錢、容易安裝、繪圖功能

- 主要語法與S語言相同，為簡化版的S統計軟體
- 1995年由Auckland大學統計系的Robert Gentleman & Ross Ihaka兩位學者發展建立，支援Windows、macOS、Linux
- 開放原始碼，可以加以修改或擴充其功能
- 可以以矩陣或是向量的形式處理數字、字串及時間等資料，並且俱有強大的繪圖能力

選擇R的理由? 可外部呼叫

R並非為封閉的程式環境。可以呼叫C、Fortran、Python & JAVA程式所寫的外部程式庫來輔助運算

已知缺點

- 不親切的使用者介面

Rstudio- 整合開發環境
(Integrated Development Environment, IDE)

- 須完全瞭解套件、函式名稱與程式撰寫邏輯
- 大量計算效能低

TIOBE全球程式語言排名

TIOBE
the software quality company

HOME COMPANY TICS PRODUCTS MARKETS TQI DOCUMENTATION

Sep 2021	Sep 2020	Change	Programming Language	Ratings	Change
1	1		C	11.83%	-4.12%
2	3	↑	Python	11.67%	+1.20%
3	2	↓	Java	11.12%	-2.37%
4	4		C++	7.13%	+0.01%
5	5		C#	5.78%	+1.20%
16	16		MATLAB	1.02%	-0.07%
17	37	⇈	Fortran	1.01%	+0.65%
18	**9**	⇊	**R**	**0.98%**	**-1.40%**
19	13	⇊	Perl	0.78%	-0.53%
20	29	⇈	Delphi/Object Pascal	0.77%	+0.24%

TIOBE全球程式語言排名

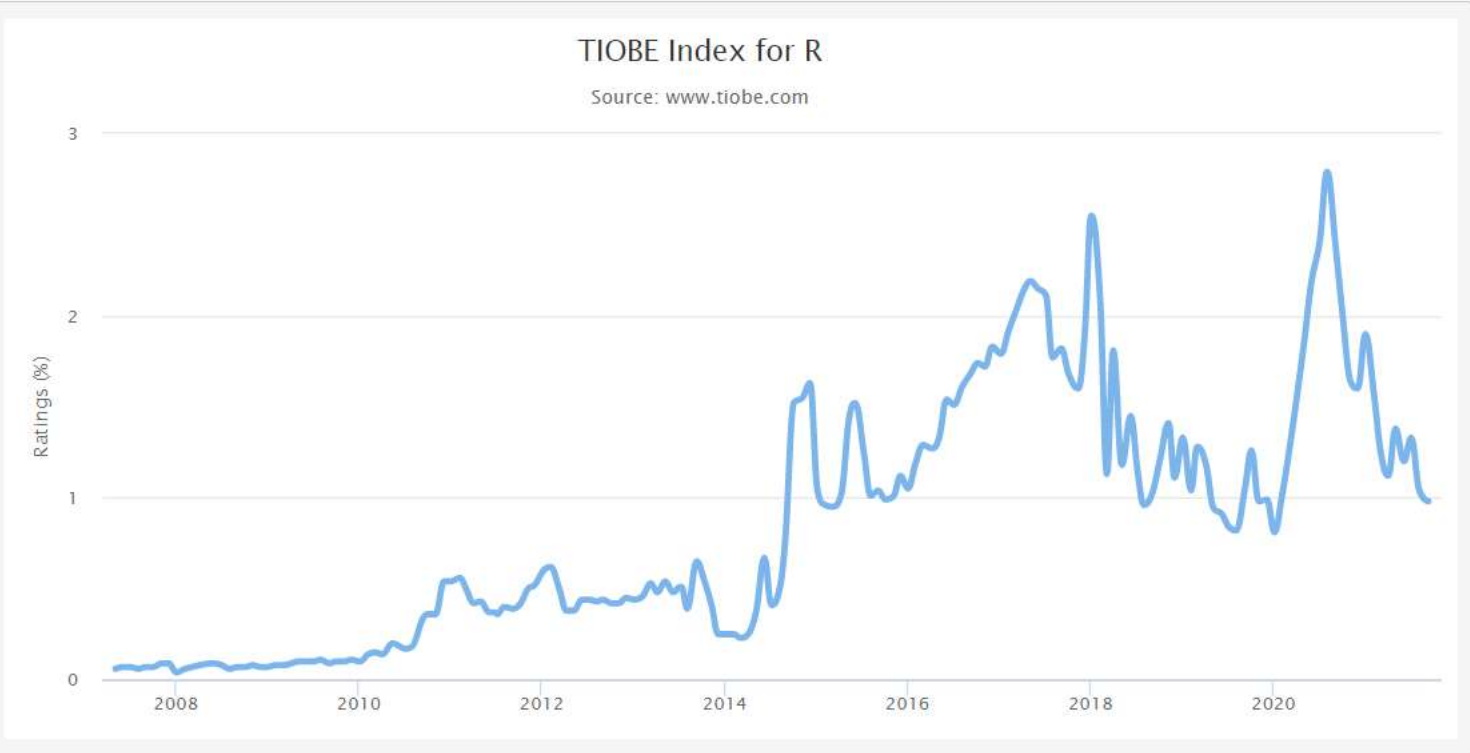
https://www.tiobe.com/tiobe-index/

The R Programming Language

Some information about R:

Highest Position (since 2007): #8 in Aug 2020

Lowest Position (since 2007): #73 in Dec 2008



The R Project for Statistical Computing

安裝前須知

Windows不要設定中文使用者名稱，若原先為中文使用者名稱者，請另外創立一個英文帳號名稱，後續將R安裝於英文帳號中。

先安裝R再安裝Rstudio

不要安裝在Windows的OneDrive資料夾

The R Project for Statistical Computing

下載及安裝R軟體

下載軟體

https://www.r-project.org/

[Home]

Download

CRAN 

R Project

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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 and install the software, or what the license terms are, please read our answers to frequently asked questions before you send an email.

News

- **R version 3.6.1 (Action of the Toes)** has been released on 2019-07-05.
- useR! 2020 will take place in St. Louis, Missouri, USA.
- **R version 3.5.3 (Great Truth)** has been released on 2019-03-11.
- The R Foundation Conference Committee has released a call for proposals to host useR! 2020 in North America.
- You can now support the R Foundation with a renewable subscription as a supporting member
- The R Foundation has been awarded the Personality/Organization of the year 2018 award by the professional association of German market and social researchers.

News via Twitter

下載及安裝R軟體

CRAN Mirrors

The Comprehensive R Archive Network is available at the following URLs, please choose a location close to you. Some statistics on the status of the mirrors can be found here: main page, windows release, windows old release.

If you want to host a new mirror at your institution, please have a look at the CRAN Mirror HOWTO.

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0-Cloud	
https://cloud.r-project.org/	Automatic redirection to servers worldwide, currently sponsored by Rstudio
Algeria	
https://cran.usthb.dz/	University of Science and Technology Houari Boumediene
Argentina	
http://mirror.fcaglp.unlp.edu.ar/CRAN/	Universidad Nacional de La Plata
Australia	
https://cran.csiro.au/	CSIRO
https://mirror.aarnet.edu.au/pub/CRAN/	AARNET
https://cran.ms.unimelb.edu.au/	School of Mathematics and Statistics, University of Melbourne
https://cran.curtin.edu.au/	Curtin University of Technology
Austria	
https://cran.wu.ac.at/	Wirtschaftsuniversität Wien
Belgium	
https://www.freestatistics.org/cran/	Patrick Wessa
https://lib.ugent.be/CRAN/	Ghent University Library
Brazil	
https://cran-r.c3sl.ufpr.br/	Universidade Federal do Parana
https://cran.fiocruz.br/	Oswaldo Cruz Foundation, Rio de Janeiro
https://vps.fmvz.usp.br/CRAN/	University of Sao Paulo, Sao Paulo
https://brieger.esalq.usp.br/CRAN/	University of Sao Paulo, Piracicaba
Bulgaria	
https://ftp.uni-sofia.bg/CRAN/	Sofia University
Canada	

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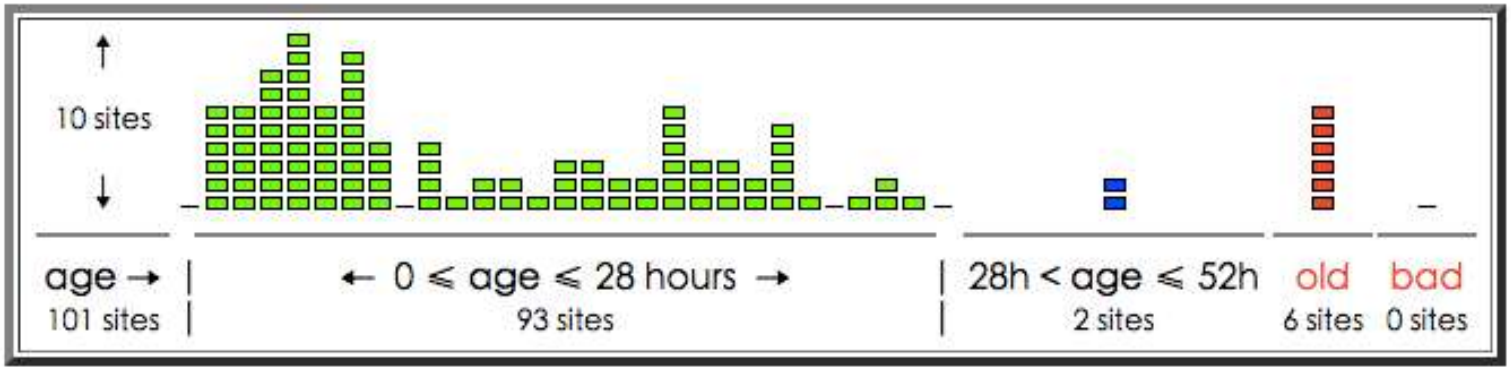
the status of CRAN mirrors

date : Sat Sep 19 22:06:01 2020 (UTC)
last check : Sat Sep 19 22:06:01 2020 (UTC)

age histogram



units ▭ ▭ ▭ ▭ represent one mirror site.

regions

ar asia at au be bg br ca ch cl cn co cr cz de dk dz ec ee es fr gr hu id
ie in ir is it jp kr ma mx my nl no nz ph pt ru se sv th tr tw uk us uy za

report

3

4

Taiwan				
cran.csie.ntu.edu.tw @	https	3.3 days	2.8 days	no time
Thailand				
mirrors.psu.ac.th @	http	23 hours	2 hours	ok
Turkey				
cran.gedik.edu.tr @	https	4 hours	2 hours	ok
cran.ncc.metu.edu.tr @	https	6 hours	renewed	ok
cran.pau.edu.tr @	https	1 hour	renewed	ok
United Kingdom				
www.stats.bris.ac.uk @	https	2 hours	renewed	ok
cran.ma.imperial.ac.uk @	https	9 hours	1 hour	ok
United States - 13 sites				
cran.mirrors.hoobly.com @	http	5 hours	renewed	ok
cran.revolutionanalytics.com @	https	22 hours	3 hours	ok
cran.case.edu @	https	18 hours	renewed	ok
lib.stat.cmu.edu @	http	4 hours	3 hours	ok
archive.linux.duke.edu @	http	16 hours	2 hours	ok
mirror.las.iastate.edu @	https	11 hours	renewed	ok
ftp.ussg.iu.edu @	http	15 hours	2 hours	ok
rweb.crmda.ku.edu @	https	18 hours	3 hours	ok

The Comprehensive R Archive Network

Download and Install R

Precompiled binary distributions of the base system and contributed packages, Windows and Mac users most likely want one of these versions of R:

- Download R for Linux
- Download R for (Mac) OS X
- Download R for Windows

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選擇作業系統相容的安裝檔

R is part of many Linux distributions, you should check with your Linux package management system in addition to the link above.

Source Code for all Platforms

Windows and Mac users most likely want to download the precompiled binaries listed in the upper box, not the source code. The sources have to be compiled before you can use them. If you do not know what this means, you probably do not want to do it!

- The latest release (2019-07-05, Action of the Toes) R-3.6.1.tar.gz, read what's new in the latest version.
- Sources of R alpha and beta releases (daily snapshots, created only in time periods before a planned release).
- Daily snapshots of current patched and development versions are available here. Please read about new features and bug fixes before filing corresponding feature requests or bug reports.
- Source code of older versions of R is available here.
- Contributed extension packages

Questions About R

- If you have questions about R like how to download and install the software, or what the license terms are, please read our answers to frequently asked questions before you send an email.

R for Windows

Subdirectories:

base	Binaries for base distribution. This is what you want to **install R for the first time**.
contrib	Binaries of contributed CRAN packages (for R >= 2.13.x; managed by Uwe Ligges). There is also information on third party software available for CRAN Windows services and corresponding environment and make variables.
old contrib	Binaries of contributed CRAN packages for outdated versions of R (for R < 2.13.x; managed by Uwe Ligges).
Rtools	Tools to build R and R packages. This is what you want to build your own packages on Windows, or to build R itself.

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Please do not submit binaries to CRAN. Package developers might want to contact Uwe Ligges directly in case of questions / suggestions related to Windows binaries.

You may also want to read the R FAQ and R for Windows FAQ.

Note: CRAN does some checks on these binaries for viruses, but cannot give guarantees. Use the normal precautions with downloaded executables.

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R-4.1.1 for Windows (32/64 bit)

Download R 4.1.1 for Windows (86 megabytes, 32/64 bit)

Installation and other instructions
New features in this version

If you want to double-check that the package you have downloaded matches the package distributed by CRAN, you can compare the md5sum of the .exe to the fingerprint on the master server. You will need a version of md5sum for windows: both graphical and command line versions are available.

Frequently asked questions

- Does R run under my version of Windows?
- How do I update packages in my previous version of R?
- Should I run 32-bit or 64-bit R?

Please see the R FAQ for general information about R and the R Windows FAQ for Windows-specific information.

Other builds

- Patches to this release are incorporated in the r-patched snapshot build.
- A build of the development version (which will eventually become the next major release of R) is available in the r-devel snapshot build.
- Previous releases

查看過去版本

Note to webmasters: A stable link which will redirect to the current Windows binary release is <CRAN MIRROR>/bin/windows/base/release.html.

Last change: 2021-08-10

下載及安裝R軟體

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Previous Releases of R for Windows

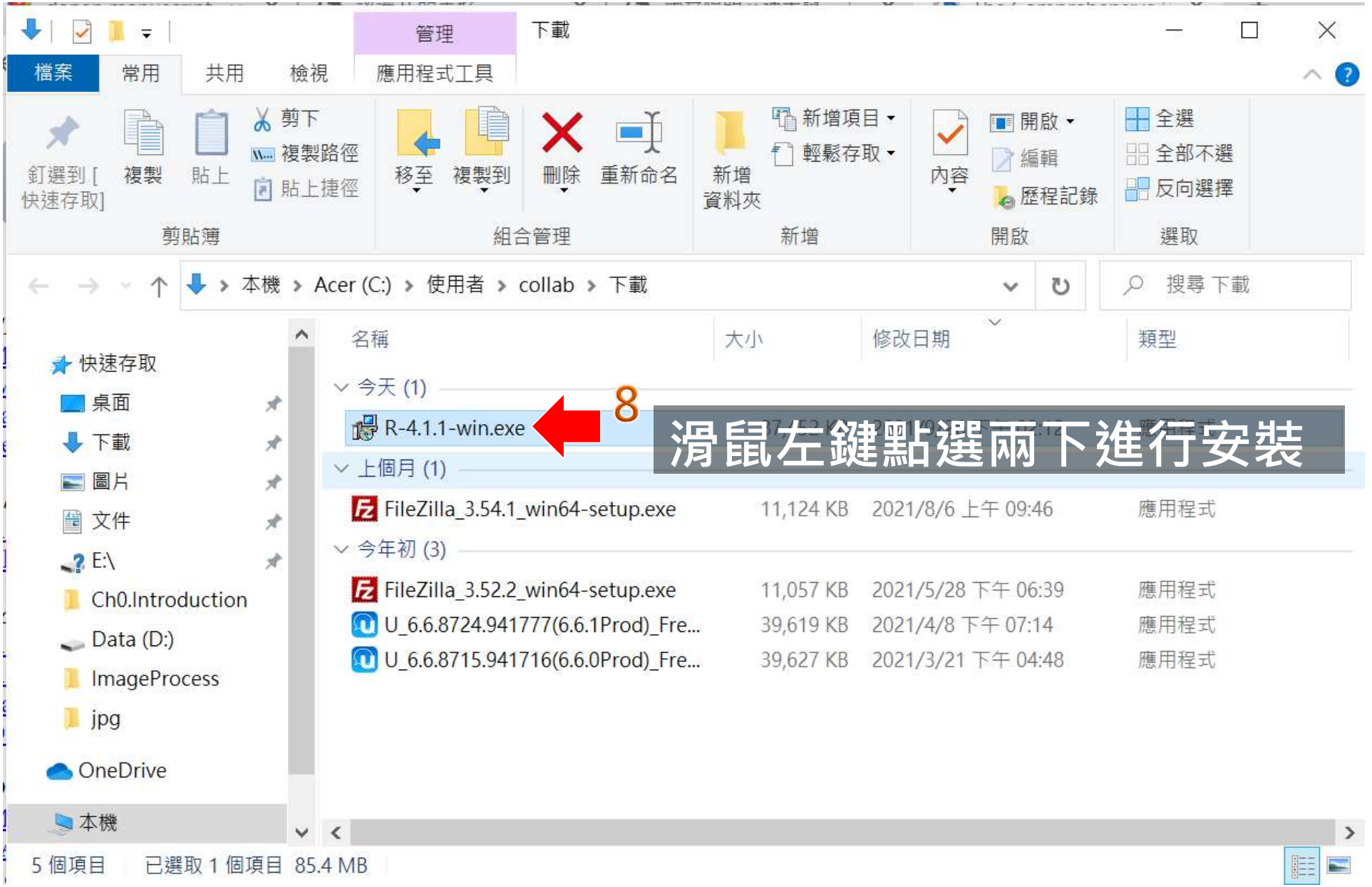
This directory contains previous binary releases of R for Windows.

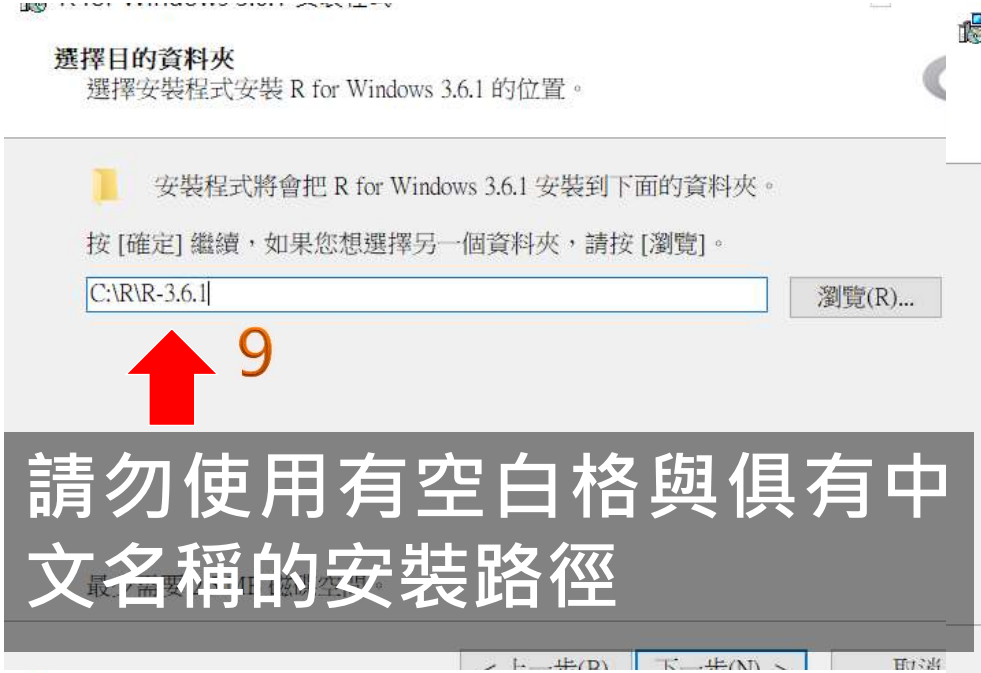
The current release, and links to development snapshots, are available here. Source code for these releases and others is available through the main CRAN page.

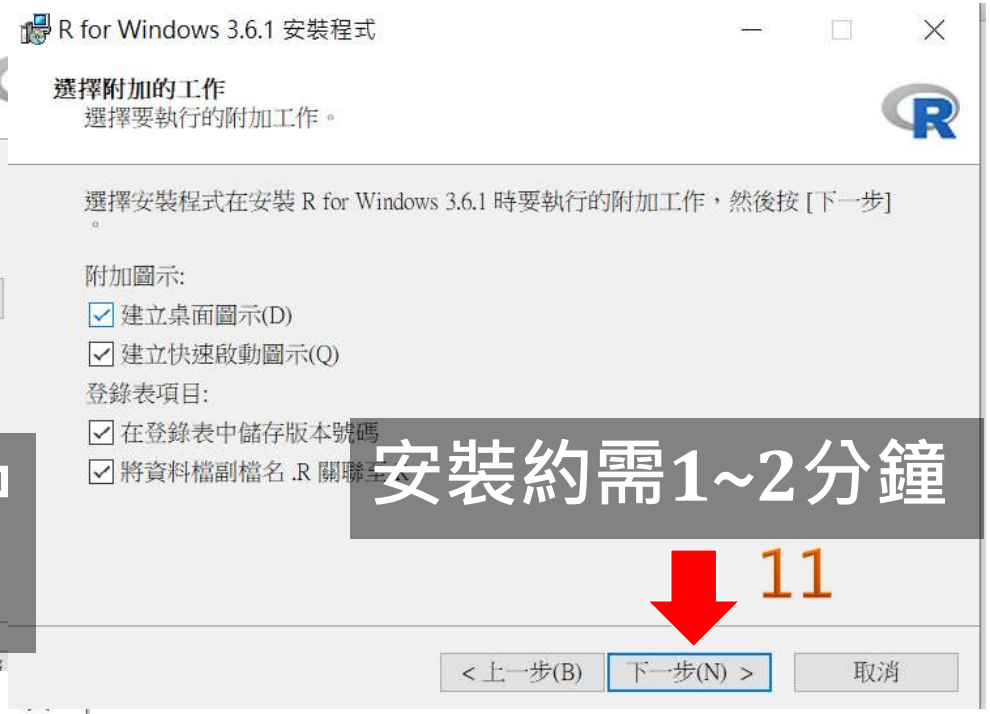
In this directory:

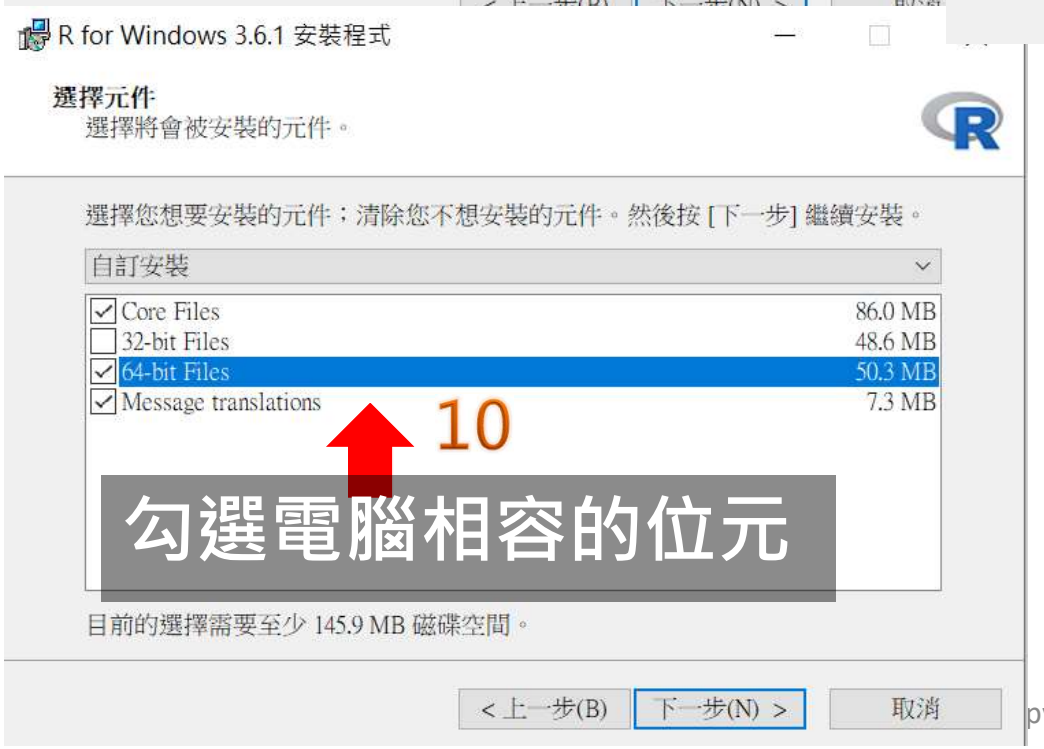
R 4.0.2 (June, 2020)
R 4.0.1 (June, 2020)
R 4.0.0 (April, 2020)
R 3.6.3 (February, 2020)
R 3.6.2 (December, 2019)
R 3.6.1 (July, 2019)
R 3.6.0 (April, 2019)
R 3.5.3 (March, 2019)
R 3.5.2 (December, 2018)
R 3.5.1 (July, 2018)
R 3.5.0 (April, 2018)
R 3.4.4 (March, 2018)
R 3.4.3 (November, 2017)
R 3.4.2 (September, 2017)
R 3.4.1 (June, 2017)
R 3.4.0 (April, 2017)
R 3.3.3 (March, 2017)
R 3.3.2 (October, 2016)
R 3.3.1 (June, 2016)
R 3.3.0 (April, 2016)
R 3.2.5 (April, 2016)
R 3.2.4 (March, 2016)
R 3.2.3 (December, 2015)
R 3.2.2 (August, 2015)
R 3.2.1 (June, 2015)
R 3.2.0 (April, 2015)
R 3.1.3 (March, 2015)
R 3.1.2 (October, 2014)
R 3.1.1 (July, 2014)
R 3.1.0 (April, 2014)
R 3.0.3 (March, 2014)
R 3.0.2 (September, 2013)

注意:版本選擇與相關套件的相容性有極大關係


管理
下載
檔案
常用
共用
檢視
應用程式工具
剪下
複製路徑
貼上捷徑
釘選到 [快速存取]
複製
貼上
移至
複製到
刪除
重新命名
新增資料夾
新增項目
輕鬆存取
內容
開啟
編輯
歷程記錄
全選
全部不選
反向選擇
剪貼簿
組合管理
新增
開啟
選取
本機 › Acer (C:) › 使用者 › collab › 下載
搜尋 下載
名稱
大小
修改日期
類型
快速存取
桌面
下載
圖片
文件
E:\
Ch0.Introduction
Data (D:)
ImageProcess
jpg
OneDrive
本機
今天 (1)
R-4.1.1-win.exe
8
滑鼠左鍵點選兩下進行安裝
上個月 (1)
FileZilla_3.54.1_win64-setup.exe 11,124 KB 2021/8/6 上午 09:46 應用程式
今年初 (3)
FileZilla_3.52.2_win64-setup.exe 11,057 KB 2021/5/28 下午 06:39 應用程式
U_6.6.8724.941777(6.6.1Prod)_Fre... 39,619 KB 2021/4/8 下午 07:14 應用程式
U_6.6.8715.941716(6.6.0Prod)_Fre... 39,627 KB 2021/3/21 下午 04:48 應用程式
5 個項目
已選取 1 個項目 85.4 MB


選擇目的資料夾
選擇安裝程式安裝 R for Windows 3.6.1 的位置。
安裝程式將會把 R for Windows 3.6.1 安裝到下面的資料夾。
按 [確定] 繼續，如果您想選擇另一個資料夾，請按 [瀏覽]。
C:\R\R-3.6.1
瀏覽(R)...
9
請勿使用有空白格與俱有中文名稱的安裝路徑


R for Windows 3.6.1 安裝程式
選擇附加的工作
選擇要執行的附加工作。
選擇安裝程式在安裝 R for Windows 3.6.1 時要執行的附加工作，然後按 [下一步]
附加圖示:
建立桌面圖示(D)
建立快速啟動圖示(Q)
登錄表項目:
在登錄表中儲存版本號碼
安裝約需1~2分鐘
11
< 上一步(B)
下一步(N) >
取消


R for Windows 3.6.1 安裝程式
選擇元件
選擇將會被安裝的元件。
選擇您想要安裝的元件；清除您不想安裝的元件。然後按 [下一步] 繼續安裝。
自訂安裝
Core Files 86.0 MB
32-bit Files 48.6 MB
64-bit Files 50.3 MB
Message translations 7.3 MB
10
勾選電腦相容的位元
目前的選擇需要至少 145.9 MB 磁碟空間。
< 上一步(B)
下一步(N) >
取消


12
R x64 4.1.1
確認桌面的icon
點選開啓

R執行程序環境

恭喜您! 已可進行R分析程序

下載及安裝RStudio軟體

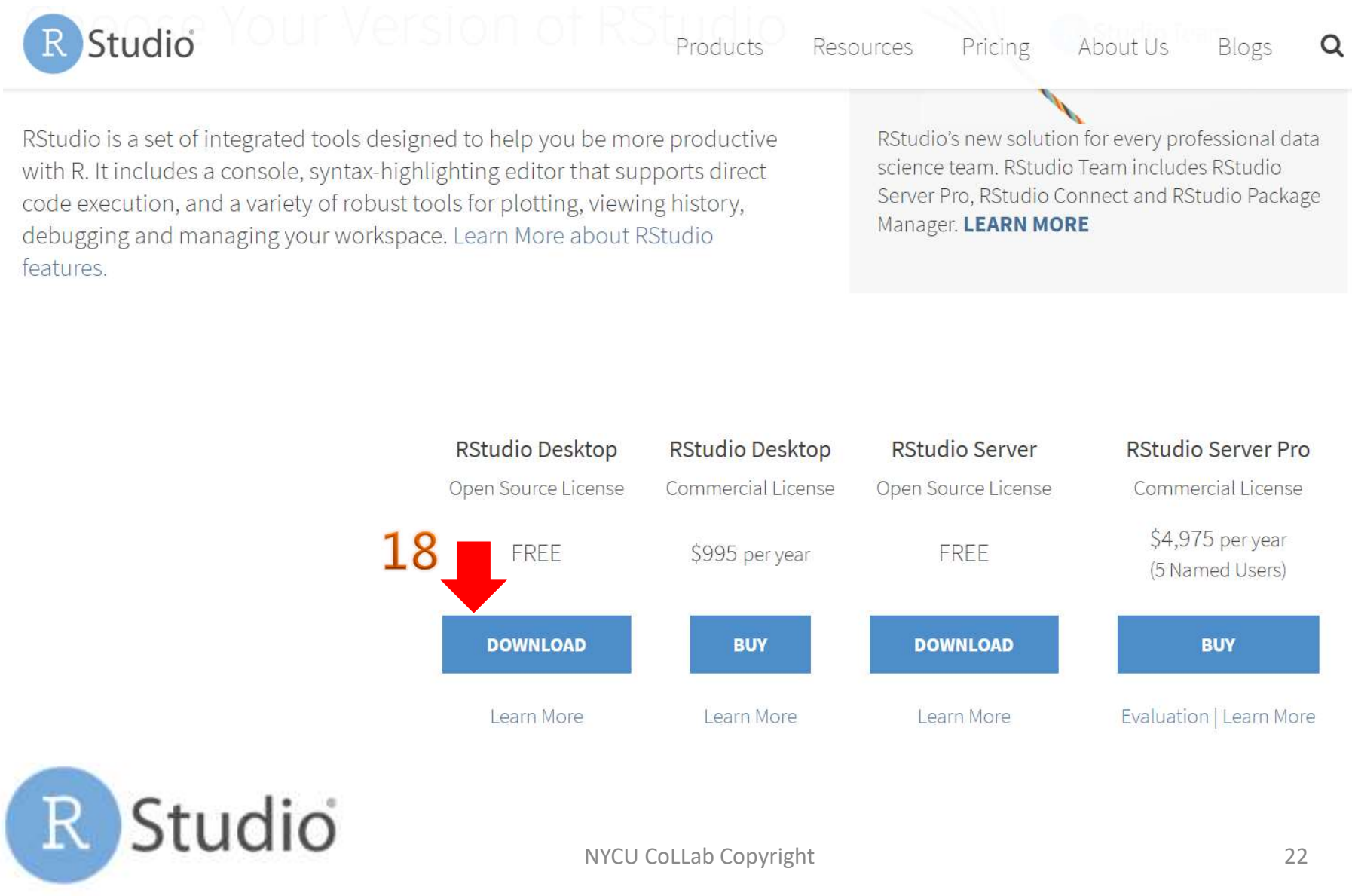
僅支援R版本R 3.0.1以上

下載軟體

https://www.rstudio.com/products/rstudio/download/

是為R語言設計的一種跨平台**整合開發環境**，並分為在本地電腦上執行的桌面版和與伺服器上執行而可由瀏覽器連接後使用的伺服器版

下載及安裝RStudio軟體



下載及安裝RStudio軟體

All Installers

選擇作業系統相容的安裝檔

Linux users may need to import RStudio's public code-signing key prior to installation, depending on the operating system's security policy.

RStudio requires a 64-bit operating system. If you are on a 32 bit system, you can use an older version of RStudio.

OS	Download	Size	SHA-256
Windows 10	RStudio-1.4.1717.exe	156.18 MB	71b36e64
macOS 10.14+	RStudio-1.4.1717.dmg	203.06 MB	2cf2549d
Ubuntu 18/Debian 10	rstudio-1.4.1717-amd64.deb	122.51 MB	e27b2645
Fedora 19/Red Hat 7	rstudio-1.4.1717-x86_64.rpm	138.42 MB	648e2be0
Fedora 28/Red Hat 8	rstudio-1.4.1717-x86_64.rpm	138.39 MB	c76f620a
	rstudio-1.4.1717-amd64.deb	123.29 MB	e4ea3a60
	rstudio-1.4.1717-x86_64.rpm	123.15 MB	e69d55db

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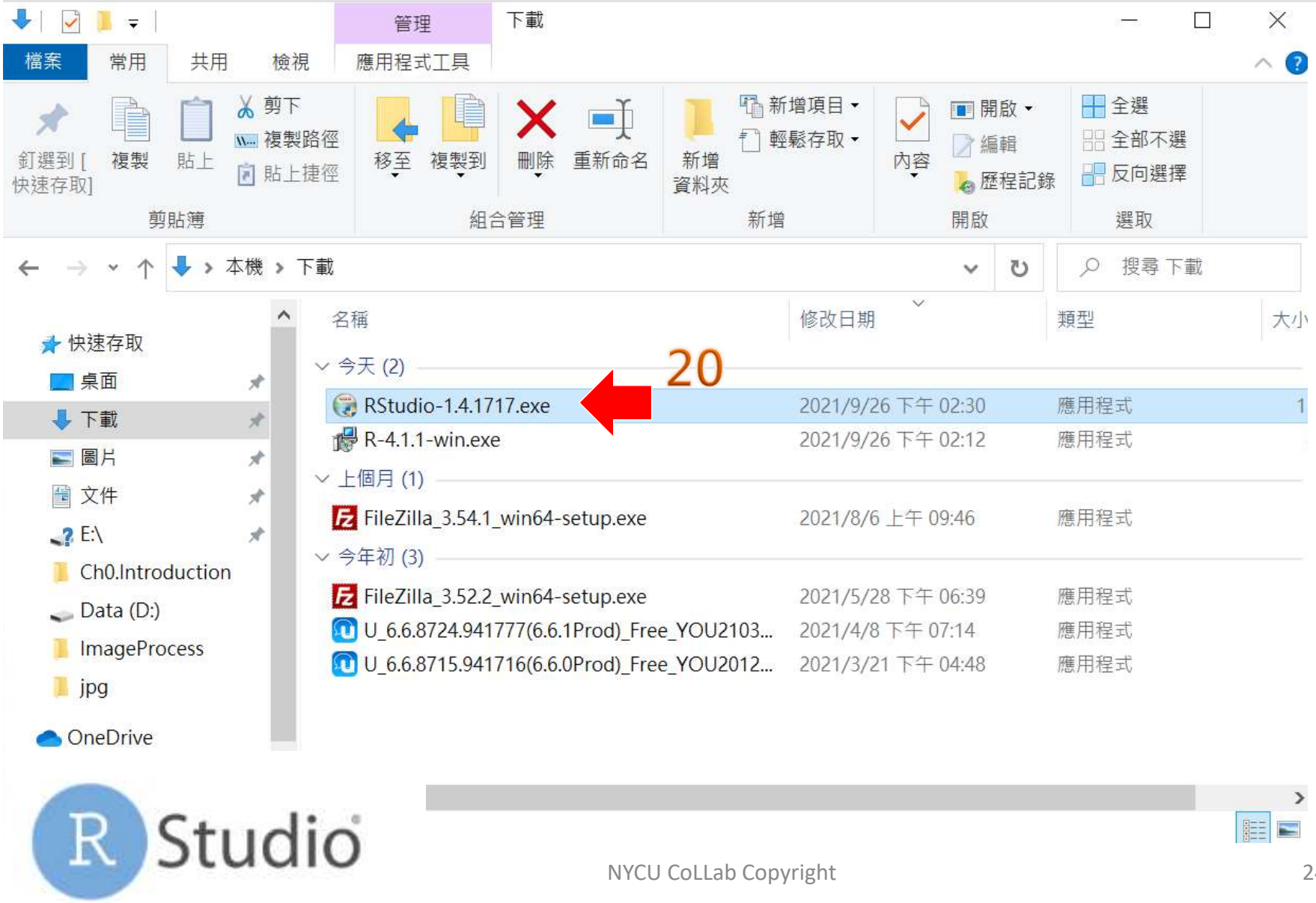
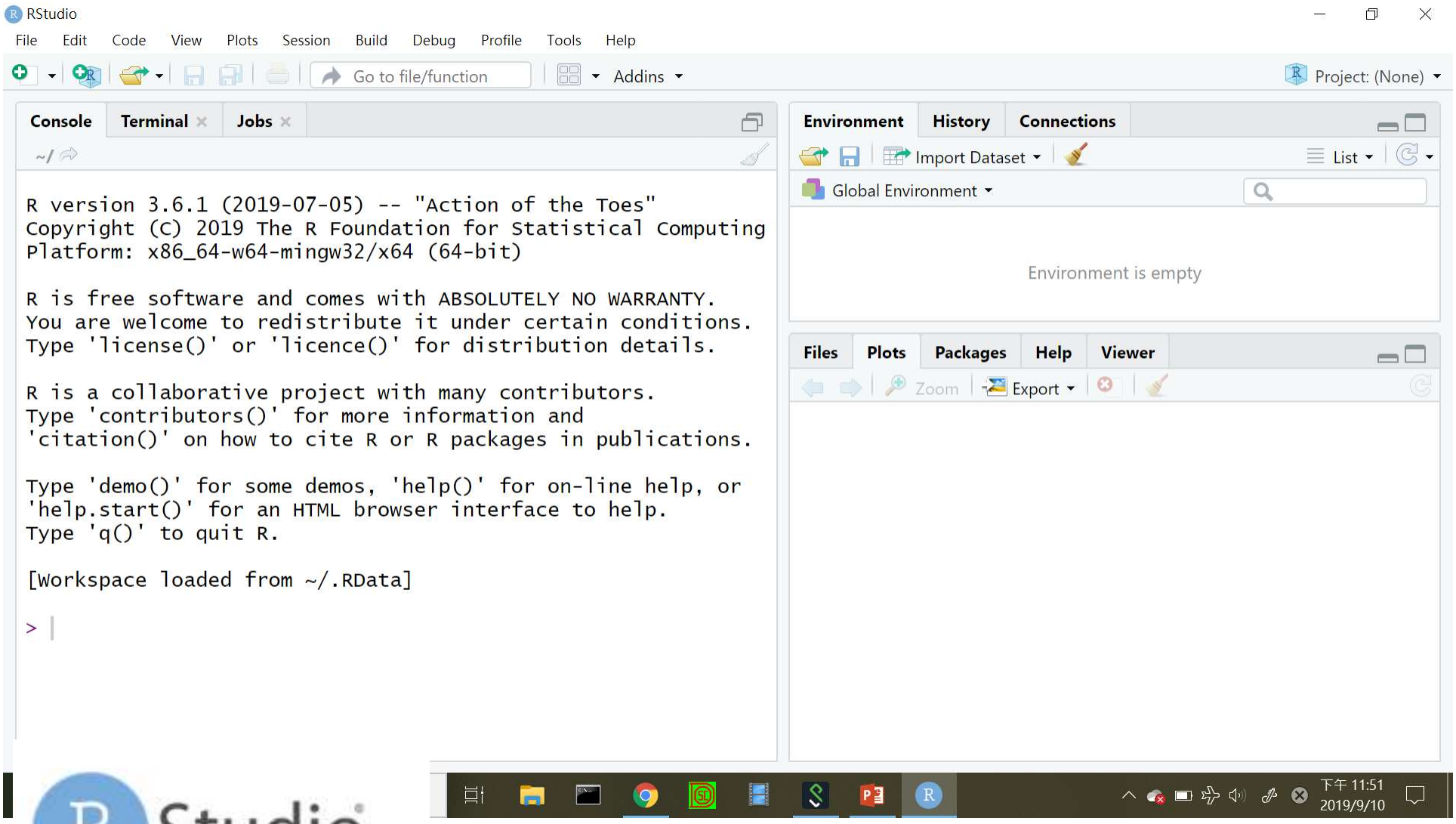
下載及安裝RStudio軟體



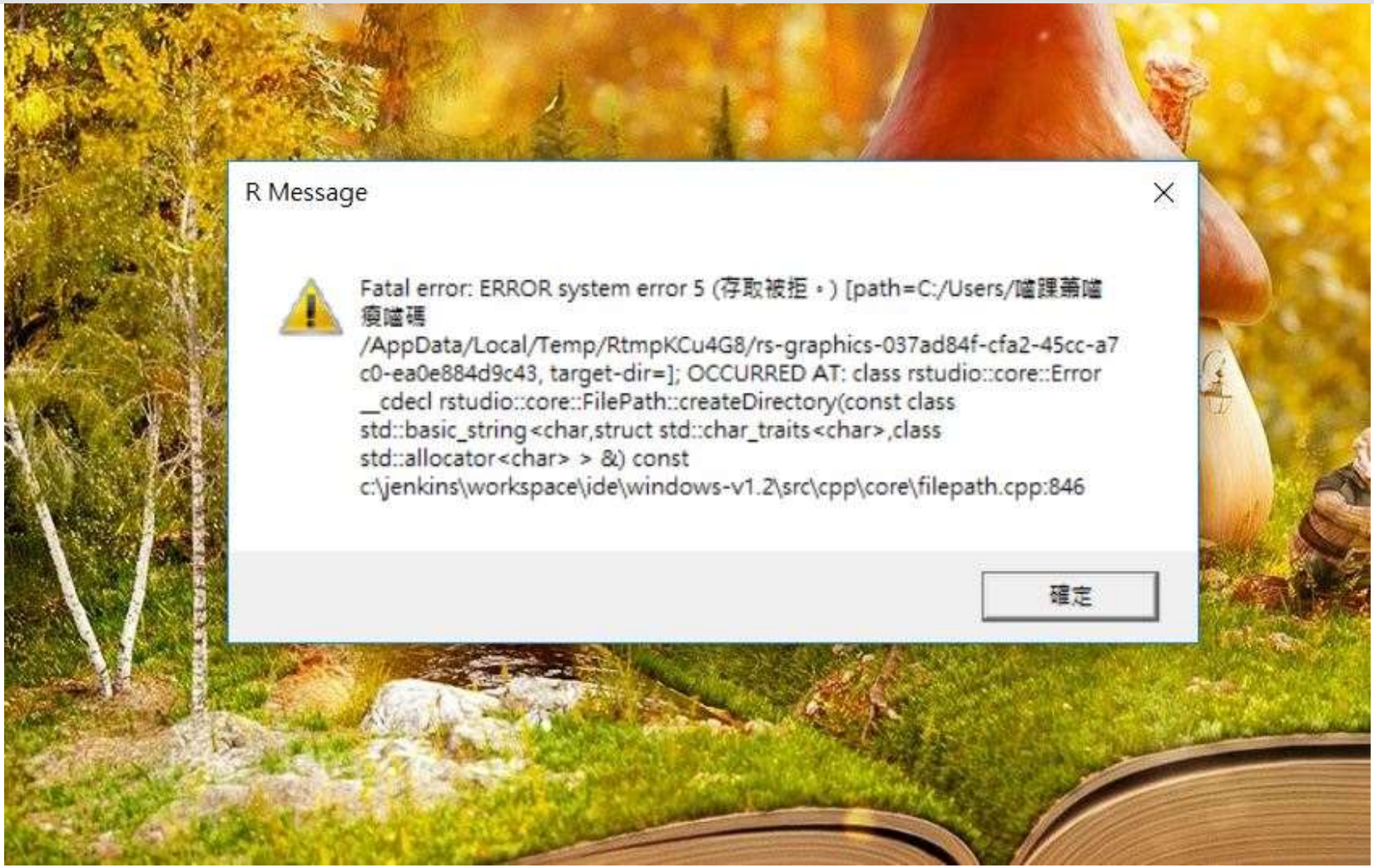
下載及安裝RStudio軟體

建立RStudio桌面路徑

RStudio介面


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Console
Terminal
Jobs
R version 3.6.1 (2019-07-05) -- "Action of the Toes"
Copyright (C) 2019 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
[Workspace loaded from ~/.RData]
>
Environment
History
Connections
Import Dataset
List
Global Environment
Environment is empty
Files
Plots
Packages
Help
Viewer
Zoom
Export
下午 11:51
2019/9/10

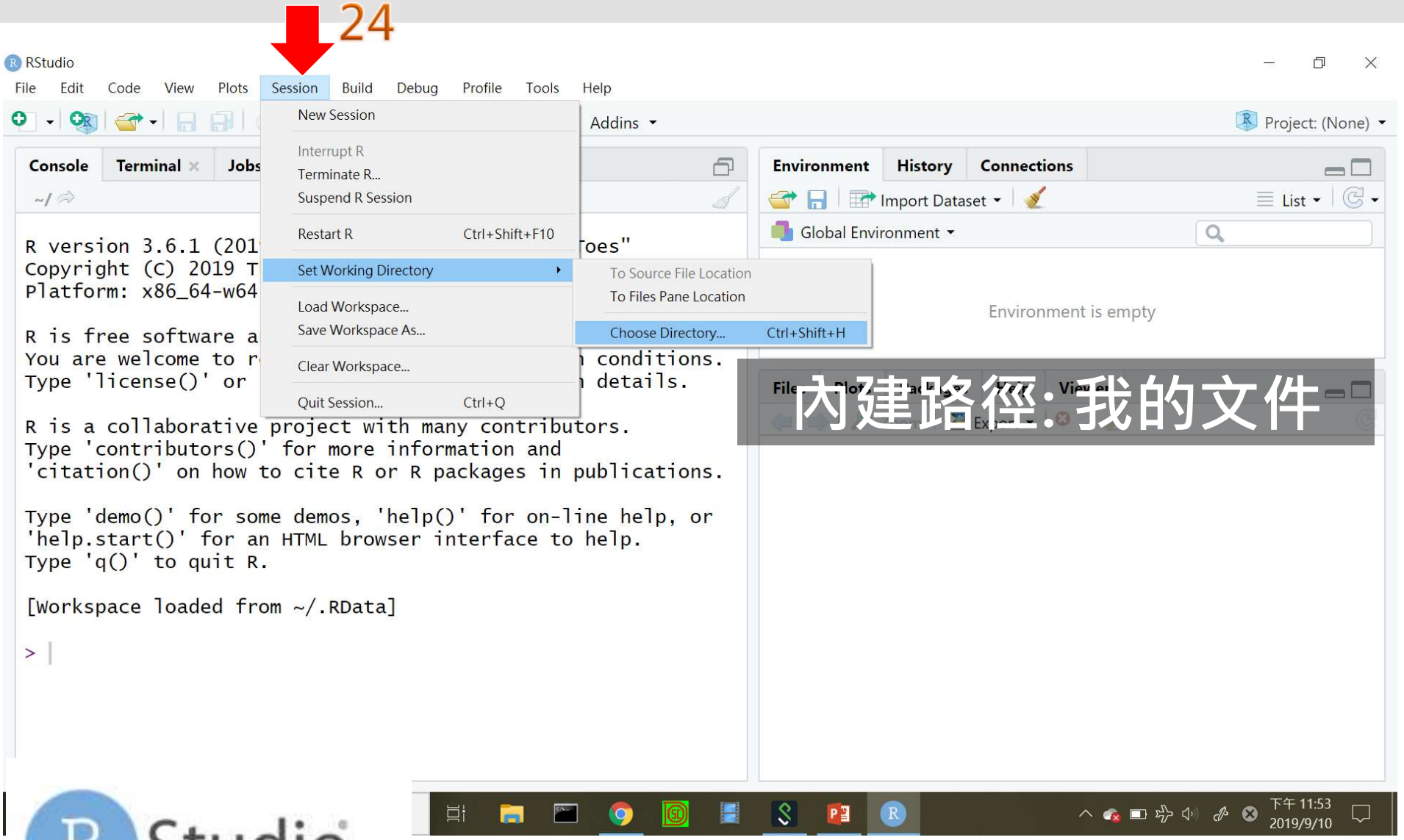
RStudio無法開啟問題



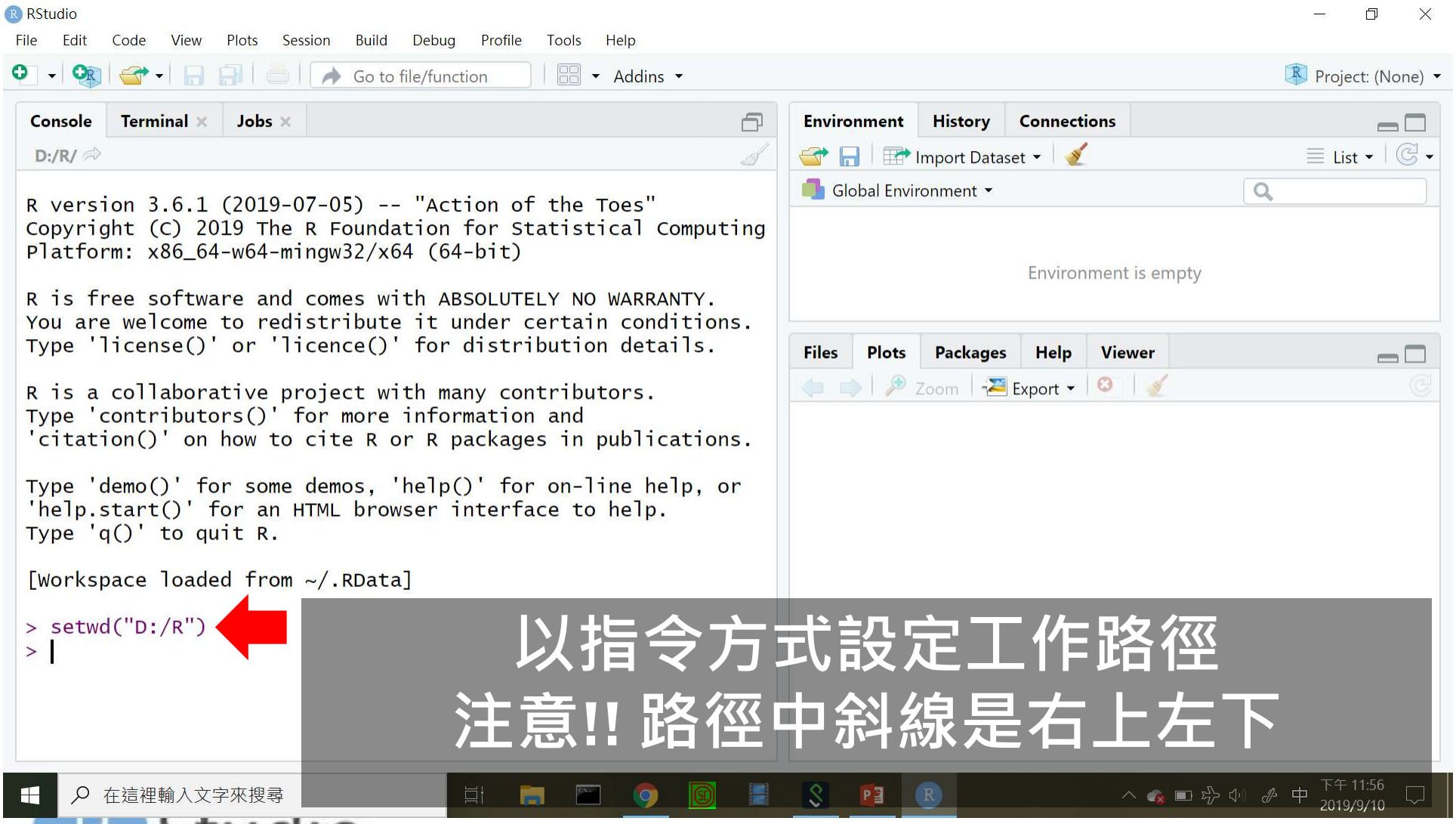
RStudio無法開啟問題

右鍵點選Rstudio
選擇
以系統管理員身分

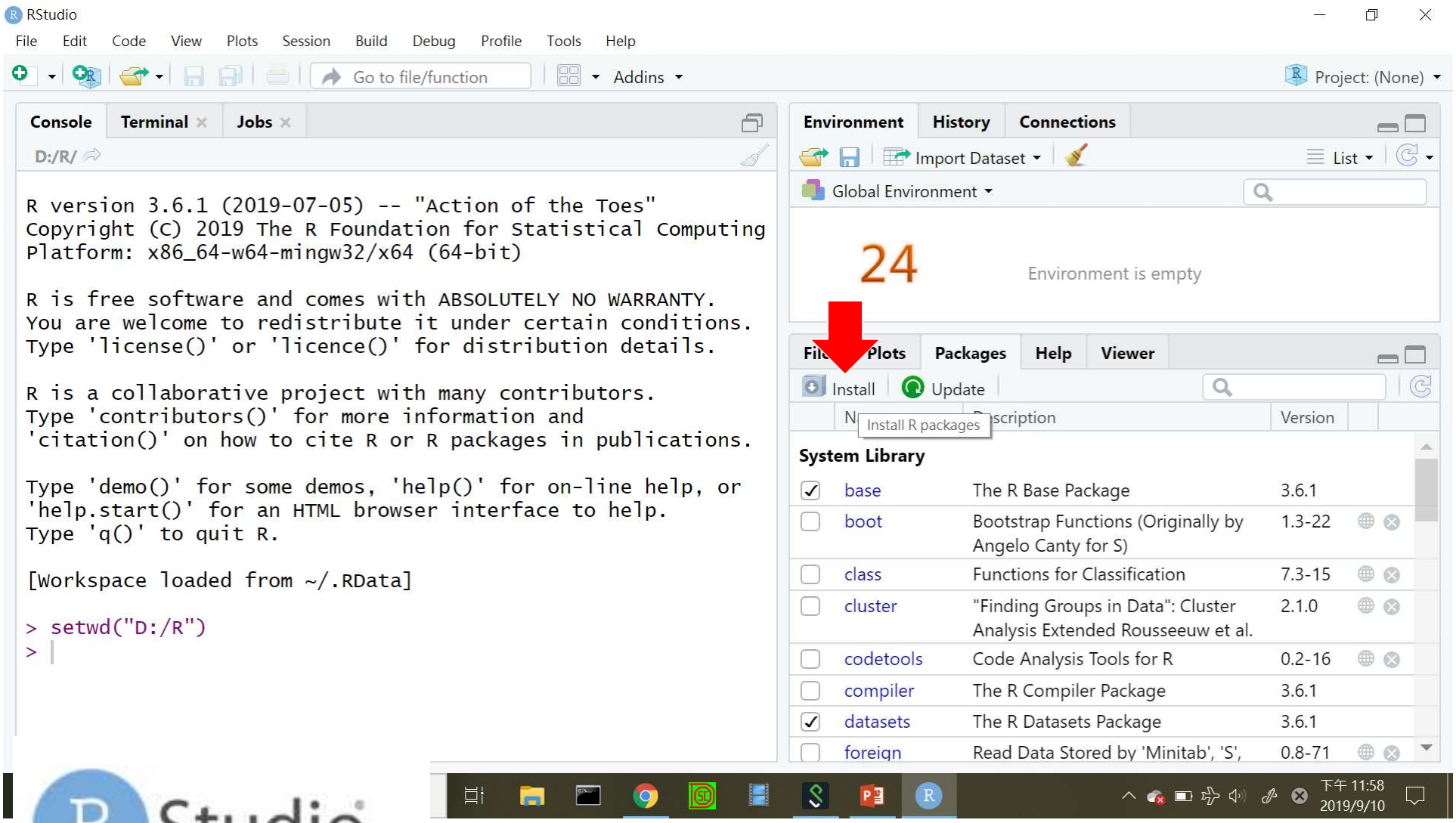
設定本機工作目錄路徑


24
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
New Session
Interrupt R
Terminate R...
Suspend R Session
Restart R Ctrl+Shift+F10
Set Working Directory
Load Workspace...
Save Workspace As...
Clear Workspace...
Quit Session... Ctrl+Q
To Source File Location
To Files Pane Location
Choose Directory... Ctrl+Shift+H
Addins
Project: (None)
Console Terminal Jobs
R version 3.6.1 (201
Copyright (C) 2019 T
Platform: x86_64-w64
R is free software a
You are welcome to r
Type 'license()' or
conditions.
details.
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
[Workspace loaded from ~/.RData]
>
Environment History Connections
Import Dataset
List
Global Environment
Environment is empty
內建路徑:我的文件
下午 11:53
2019/9/10

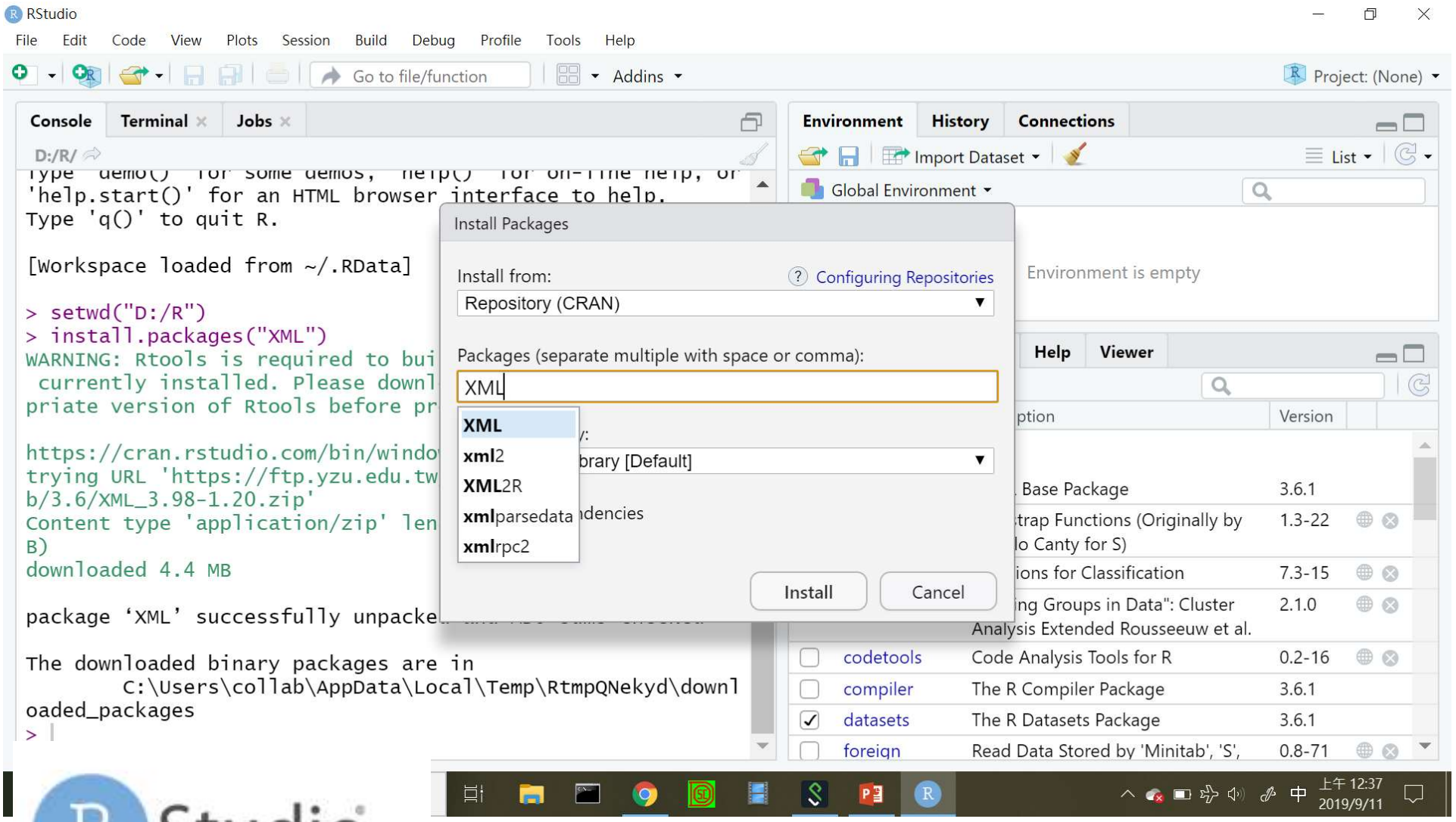
設定本機工作目錄路徑


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Console
Terminal
Jobs
D:/R/
R version 3.6.1 (2019-07-05) -- "Action of the Toes"
Copyright (C) 2019 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
[Workspace loaded from ~/.RData]
> setwd("D:/R")
>
Environment
History
Connections
Import Dataset
List
Global Environment
Environment is empty
Files
Plots
Packages
Help
Viewer
Zoom
Export
以指令方式設定工作路徑
注意!! 路徑中斜線是右上左下
在這裡輸入文字來搜尋
下午 11:56
2019/9/10

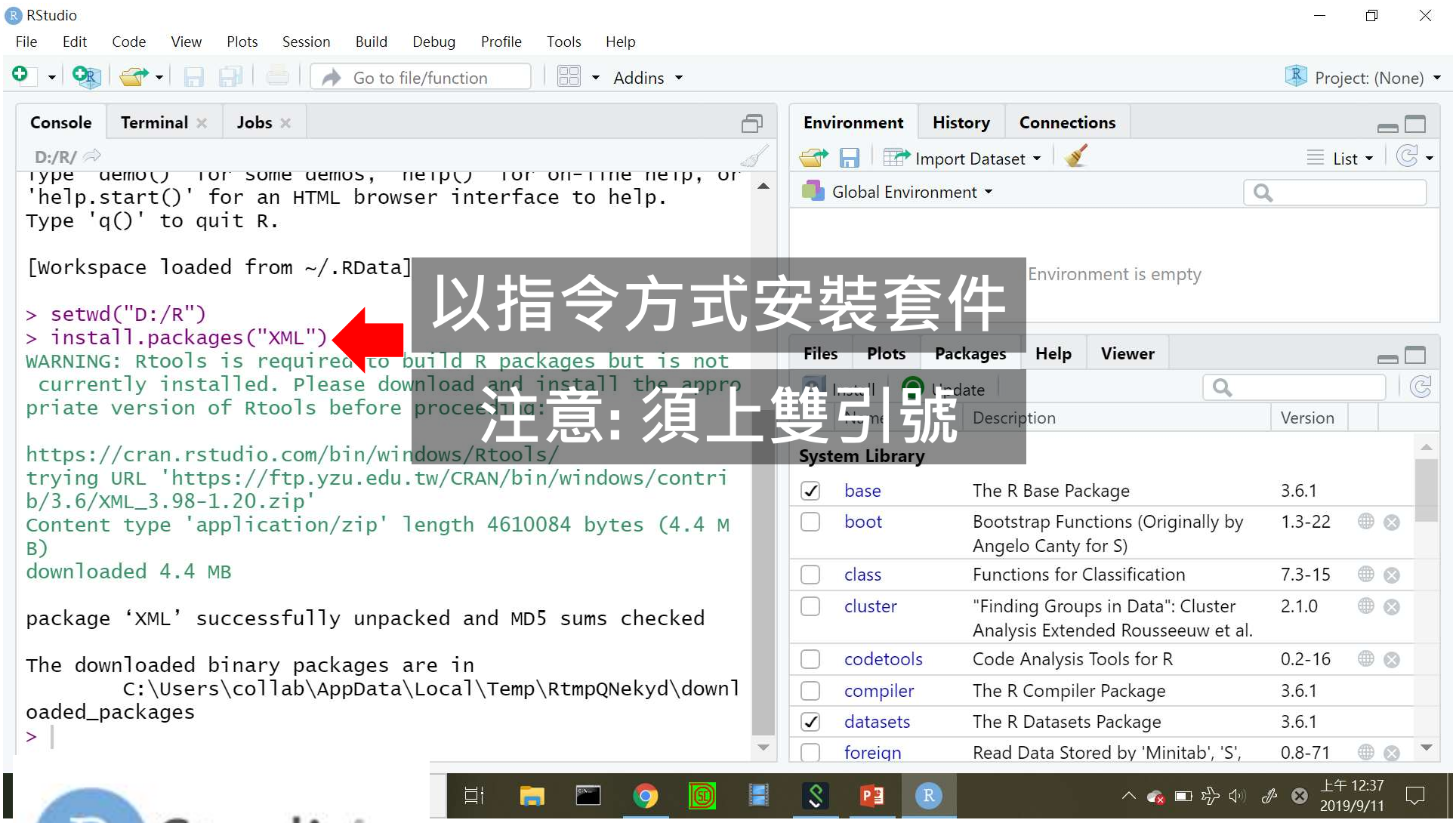
手動更新套件(Library)方法



範例: 更新套件-XML

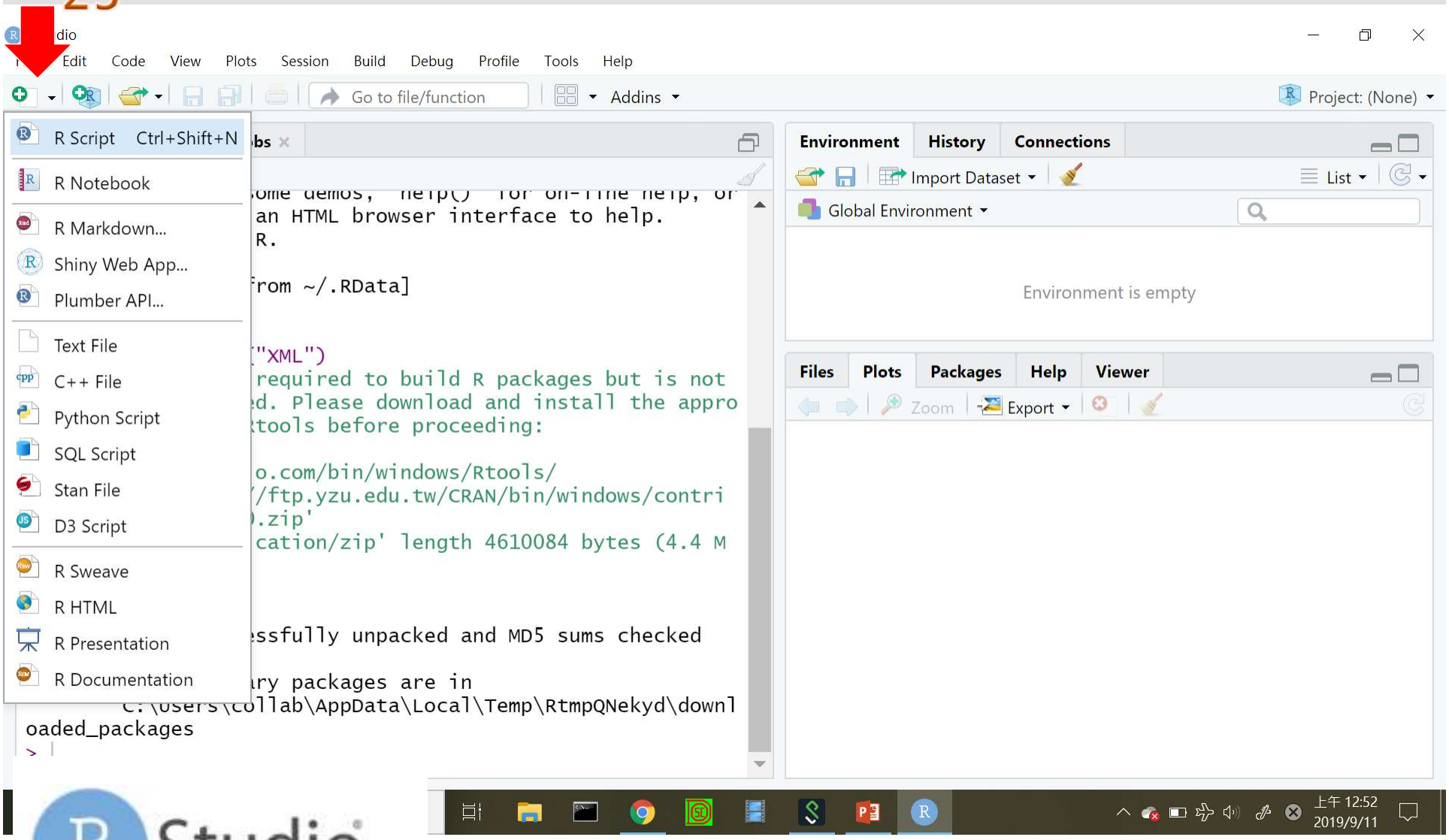

RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Console
Terminal
Jobs
D:/R/
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
[Workspace loaded from ~/.RData]
> setwd("D:/R")
> install.packages("XML")
WARNING: Rtools is required to bui
currently installed. Please downl
priate version of Rtools before pr
https://cran.rstudio.com/bin/windo
trying URL 'https://ftp.yzu.edu.tw
b/3.6/XML_3.98-1.20.zip'
Content type 'application/zip' len
B)
downloaded 4.4 MB
package 'XML' successfully unpacke
The downloaded binary packages are in
C:\Users\collab\AppData\Local\Temp\RtmpQNekyd\downl
oaded_packages
Environment
History
Connections
Import Dataset
List
Global Environment
Environment is empty
Install Packages
Install from:
Configuring Repositories
Repository (CRAN)
Packages (separate multiple with space or comma):
XML
XML
xml2
XML2R
xmlparsedata
xmlrpc2
brary [Default]
ndencies
Install
Cancel
Help
Viewer
Version
Base Package 3.6.1
trap Functions (Originally by lo Canty for S) 1.3-22
ions for Classification 7.3-15
ng Groups in Data": Cluster Analysis Extended Rousseeuw et al. 2.1.0
codetools Code Analysis Tools for R 0.2-16
compiler The R Compiler Package 3.6.1
datasets The R Datasets Package 3.6.1
foreign Read Data Stored by 'Minitab', 'S', 0.8-71
上午 12:37
2019/9/11

範例: 更新套件-XML

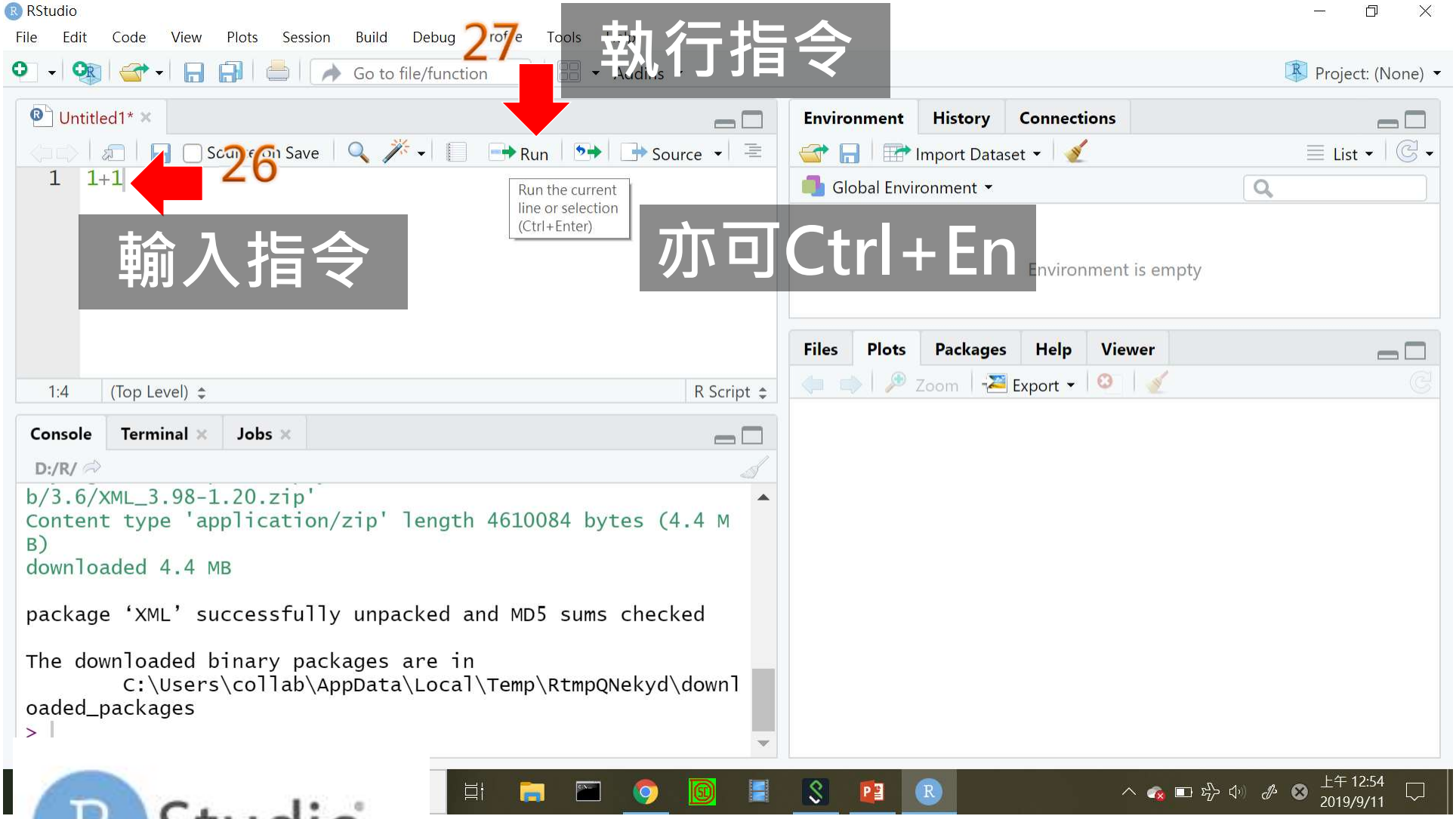

RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Console
Terminal
Jobs
D:/R/
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
[Workspace loaded from ~/.RData]
> setwd("D:/R")
> install.packages("XML")
WARNING: Rtools is required to build R packages but is not
currently installed. Please download and install the appro
priate version of Rtools before proceeding:
https://cran.rstudio.com/bin/windows/Rtools/
trying URL 'https://ftp.yzu.edu.tw/CRAN/bin/windows/contri
b/3.6/XML_3.98-1.20.zip'
Content type 'application/zip' length 4610084 bytes (4.4 M
B)
downloaded 4.4 MB
package 'XML' successfully unpacked and MD5 sums checked
The downloaded binary packages are in
C:\Users\collab\AppData\Local\Temp\RtmpQNekyd\downl
oaded_packages
Environment
History
Connections
Import Dataset
List
Global Environment
Environment is empty
以指令方式安裝套件
注意: 須上雙引號
Files
Plots
Packages
Help
Viewer
Description
Version
System Library
base The R Base Package 3.6.1
boot Bootstrap Functions (Originally by Angelo Canty for S) 1.3-22
class Functions for Classification 7.3-15
cluster "Finding Groups in Data": Cluster Analysis Extended Rousseeuw et al. 2.1.0
codetools Code Analysis Tools for R 0.2-16
compiler The R Compiler Package 3.6.1
datasets The R Datasets Package 3.6.1
foreign Read Data Stored by 'Minitab', 'S', 0.8-71
上午 12:37
2019/9/11

新增R程式編輯介面

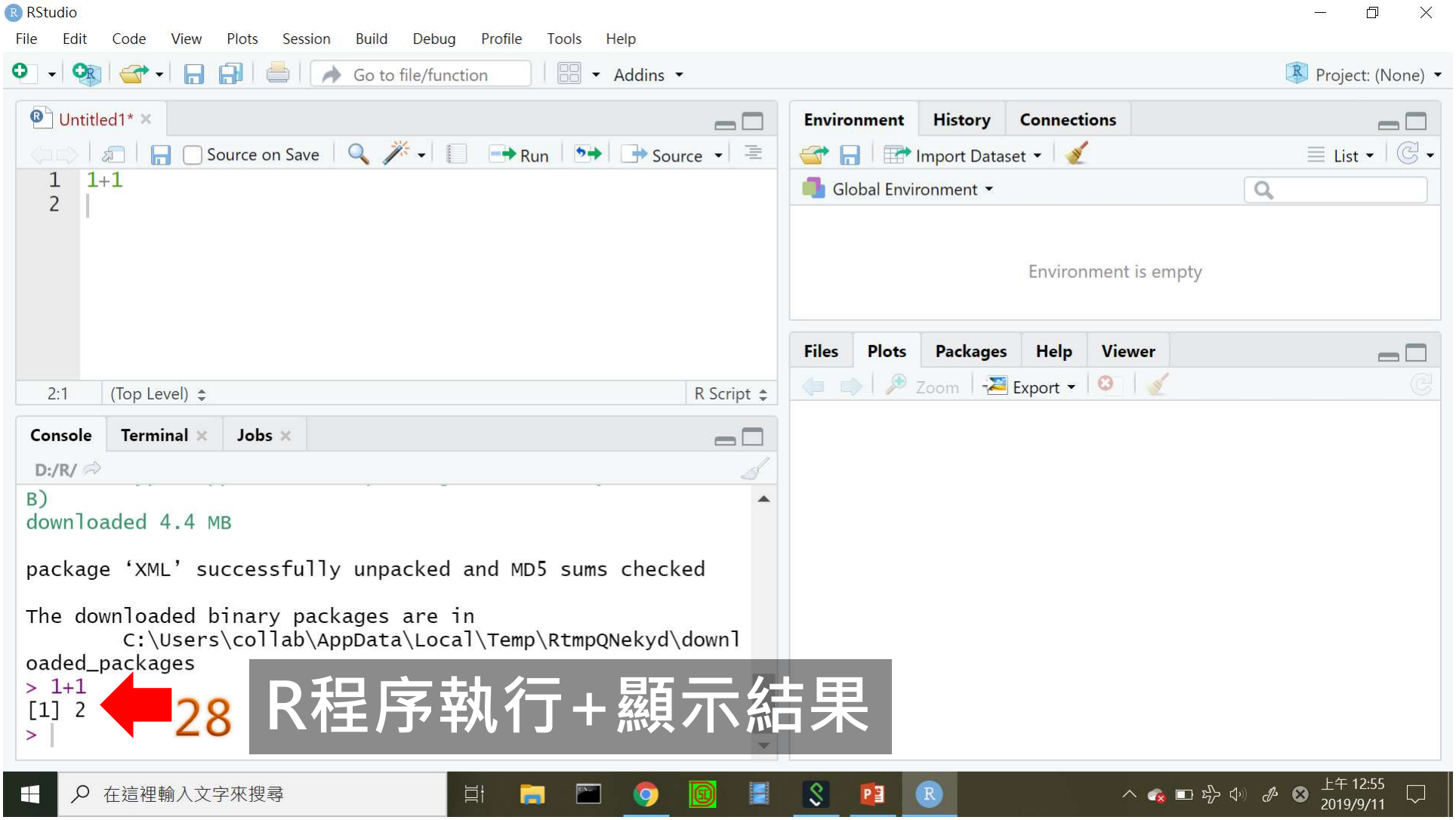
25



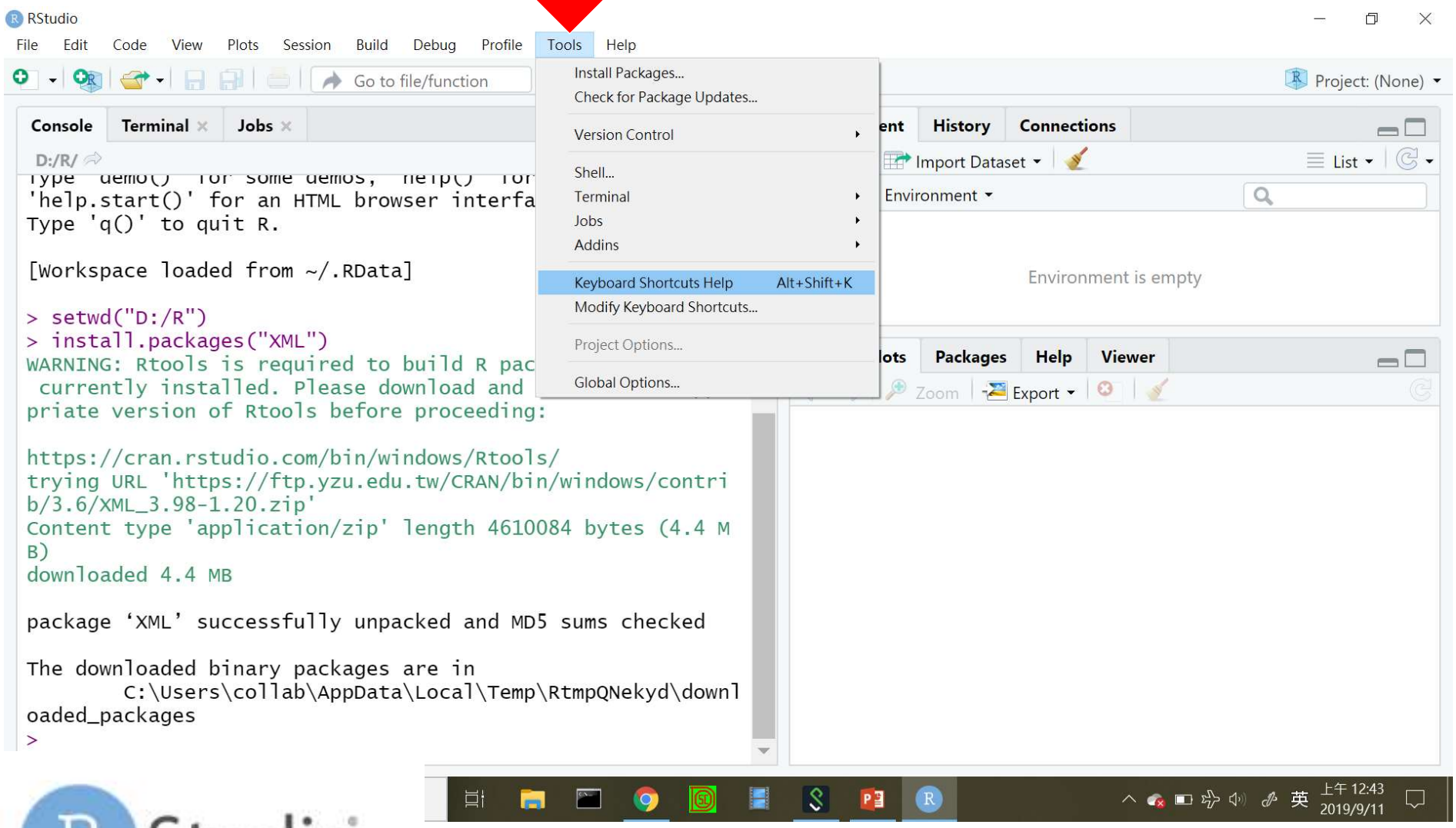
簡易R程式編輯+執行


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Project: (None)
執行指令
27
Untitled1*
Source on Save
Run
Source
1 1+1
26
Run the current line or selection (Ctrl+Enter)
輸入指令
亦可Ctrl+En
1:4 (Top Level) R Script
Console Terminal Jobs
D:/R/
b/3.6/XML_3.98-1.20.zip'
Content type 'application/zip' length 4610084 bytes (4.4 MB)
downloaded 4.4 MB
package 'XML' successfully unpacked and MD5 sums checked
The downloaded binary packages are in
C:\Users\collab\AppData\Local\Temp\RtmpQNekyd\downloaded_packages
>
Environment History Connections
Import Dataset
List
Global Environment
Environment is empty
Files Plots Packages Help Viewer
Zoom
Export
上午 12:54
2019/9/11

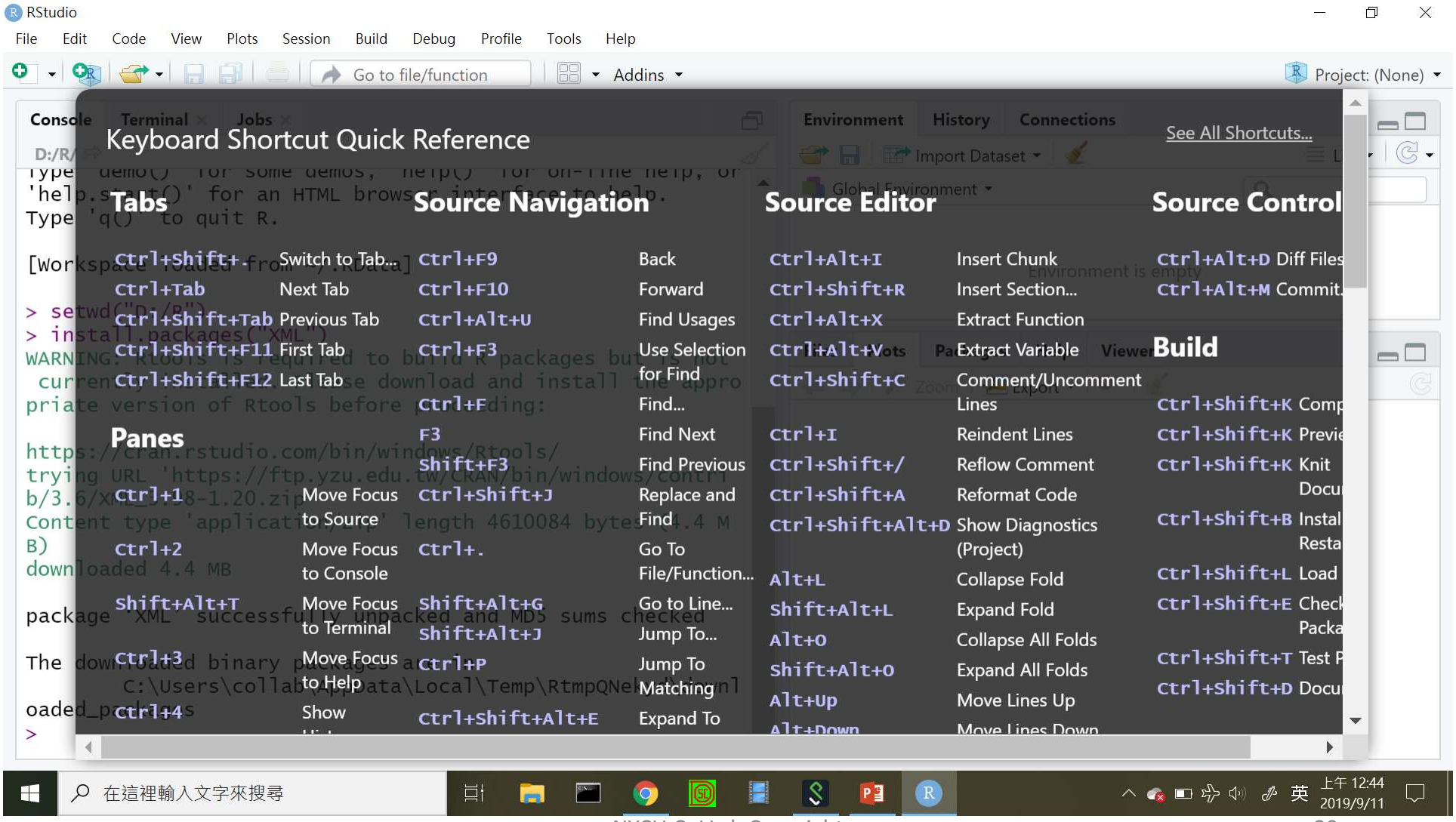
簡易R程式編輯+執行


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Untitled1*
Source on Save
Run
Source
1+1
2:1
(Top Level)
R Script
Environment History Connections
Import Dataset
List
Global Environment
Environment is empty
Files Plots Packages Help Viewer
Zoom
Export
Console Terminal Jobs
D:/R/
B)
downloaded 4.4 MB
package 'XML' successfully unpacked and MD5 sums checked
The downloaded binary packages are in
C:\Users\collab\AppData\Local\Temp\RtmpQNekyd\downl
oaded_packages
> 1+1
[1] 2
>
28
R程序執行+顯示結果
在這裡輸入文字來搜尋
上午 12:55
2019/9/11

快捷鍵一覽

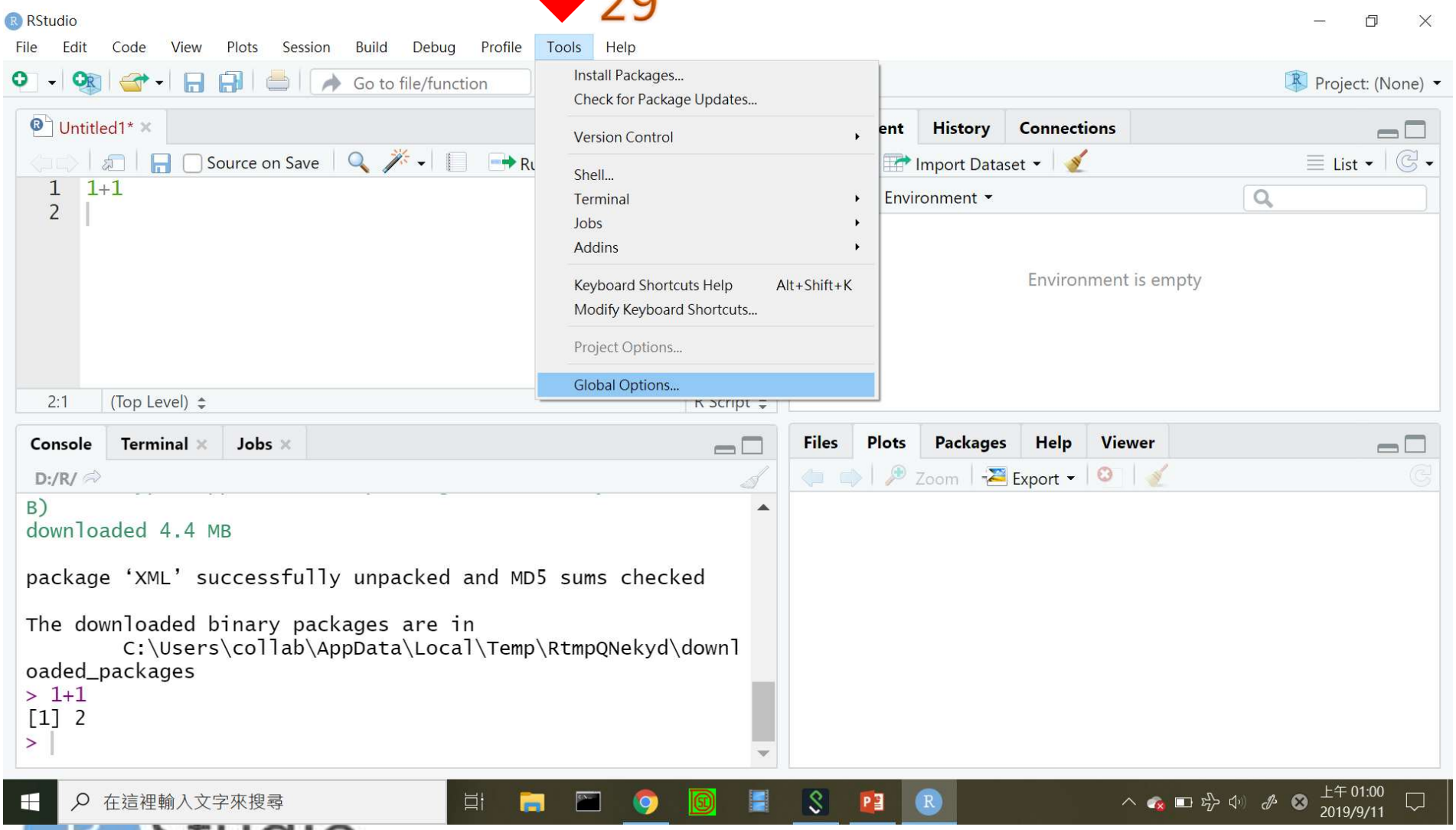

RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Project: (None)
Console Terminal Jobs
D:/R/
'help.start()' for an HTML browser interfa
Type 'q()' to quit R.
[Workspace loaded from ~/.RData]
> setwd("D:/R")
> install.packages("XML")
WARNING: Rtools is required to build R pac
currently installed. Please download and
priate version of Rtools before proceeding:
https://cran.rstudio.com/bin/windows/Rtools/
trying URL 'https://ftp.yzu.edu.tw/CRAN/bin/windows/contri
b/3.6/XML_3.98-1.20.zip'
Content type 'application/zip' length 4610084 bytes (4.4 M
B)
downloaded 4.4 MB
package 'XML' successfully unpacked and MD5 sums checked
The downloaded binary packages are in
C:\Users\collab\AppData\Local\Temp\RtmpQNekyd\downl
oaded_packages
>
Install Packages...
Check for Package Updates...
Version Control
Shell...
Terminal
Jobs
Addins
Keyboard Shortcuts Help Alt+Shift+K
Modify Keyboard Shortcuts...
Project Options...
Global Options...
History Connections
Import Dataset
List
Environment
Environment is empty
Packages Help Viewer
Zoom
Export
英 上午 12:43 2019/9/11

快捷鍵一覽

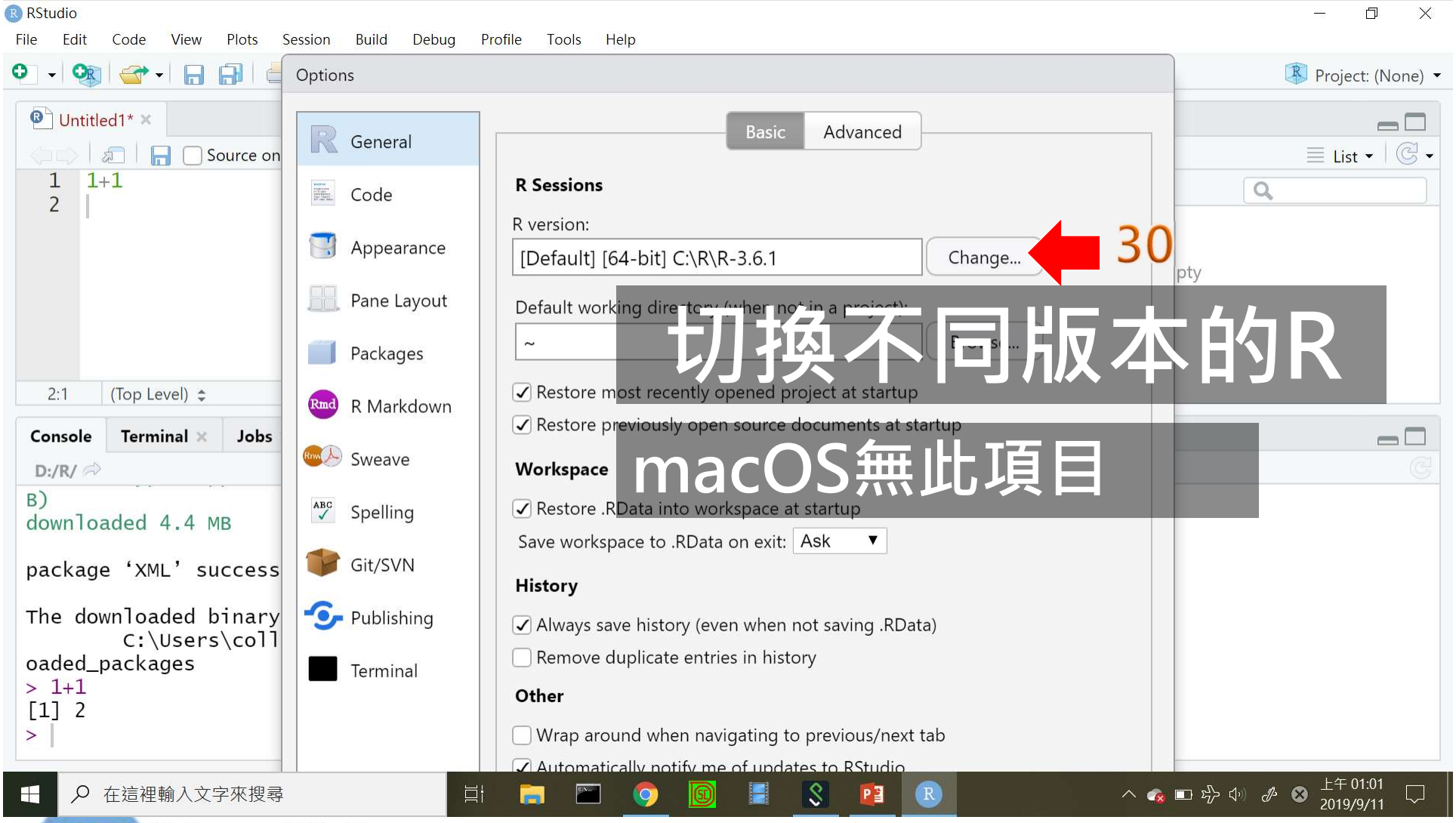

RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Console Terminal Jobs
Environment History Connections
Import Dataset
Global Environment
See All Shortcuts...
Keyboard Shortcut Quick Reference
Tabs
Ctrl+Shift+. Switch to Tab...
Ctrl+Tab Next Tab
Ctrl+Shift+Tab Previous Tab
Ctrl+Shift+F11 First Tab
Ctrl+Shift+F12 Last Tab
Panes
Ctrl+1 Move Focus to Source
Ctrl+2 Move Focus to Console
Shift+Alt+T Move Focus to Terminal
Ctrl+3 Move Focus to Help
Ctrl+4 Show
Source Navigation
Ctrl+F9 Back
Ctrl+F10 Forward
Ctrl+Alt+U Find Usages
Ctrl+F3 Use Selection for Find
Ctrl+F Find...
F3 Find Next
Shift+F3 Find Previous
Ctrl+Shift+J Replace and Find
Ctrl+. Go To File/Function...
Shift+Alt+G Go to Line...
Shift+Alt+J Jump To...
Ctrl+P Jump To Matching
Ctrl+Shift+Alt+E Expand To
Source Editor
Ctrl+Alt+I Insert Chunk
Ctrl+Shift+R Insert Section...
Ctrl+Alt+X Extract Function
Ctrl+Alt+V Extract Variable
Ctrl+Shift+C Comment/Uncomment Lines
Ctrl+I Reindent Lines
Ctrl+Shift+/ Reflow Comment
Ctrl+Shift+A Reformat Code
Ctrl+Shift+Alt+D Show Diagnostics (Project)
Alt+L Collapse Fold
Shift+Alt+L Expand Fold
Alt+O Collapse All Folds
Shift+Alt+O Expand All Folds
Alt+Up Move Lines Up
Alt+Down Move Lines Down
Source Control
Ctrl+Alt+D Diff Files
Ctrl+Alt+M Commit...
Build
Ctrl+Shift+K Comp
Ctrl+Shift+K Previe
Ctrl+Shift+K Knit Docu
Ctrl+Shift+B Instal Resta
Ctrl+Shift+L Load
Ctrl+Shift+E Check Packa
Ctrl+Shift+T Test P
Ctrl+Shift+D Docu
在這裡輸入文字來搜尋
英
上午 12:44
2019/9/11

重要環境參數設定

29


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Project: (None)
Untitled1*
Source on Save
1 1+1
2
2:1 (Top Level)
Install Packages...
Check for Package Updates...
Version Control
Shell...
Terminal
Jobs
Addins
Keyboard Shortcuts Help Alt+Shift+K
Modify Keyboard Shortcuts...
Project Options...
Global Options...
History Connections
Import Dataset
List
Environment
Environment is empty
Console Terminal Jobs
D:/R/
B)
downloaded 4.4 MB
package 'XML' successfully unpacked and MD5 sums checked
The downloaded binary packages are in
C:\Users\collab\AppData\Local\Temp\RtmpQNekyd\downloaded_packages
> 1+1
[1] 2
>
Files Plots Packages Help Viewer
Zoom Export
在這裡輸入文字來搜尋
上午 01:00
2019/9/11

環境參數設定


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Options
General
Code
Appearance
Pane Layout
Packages
R Markdown
Sweave
Spelling
Git/SVN
Publishing
Terminal
Basic
Advanced
R Sessions
R version:
[Default] [64-bit] C:\R\R-3.6.1
Change...
30
Restore most recently opened project at startup
Restore previously open source documents at startup
Workspace
Restore .RData into workspace at startup
Save workspace to .RData on exit: Ask
History
Always save history (even when not saving .RData)
Remove duplicate entries in history
Other
Wrap around when navigating to previous/next tab
切換不同版本的R
macOS無此項目
Untitled1*
1+1
Console
Terminal
Jobs
package 'XML' success
> 1+1
[1] 2
Project: (None)
在這裡輸入文字來搜尋
上午 01:01
2019/9/11

macOS切換R版本

開啓終端機模式 -Terminal

macOS切換R版本

Command line:
進到安裝路徑、查看現在版本

30

```
cd /Library/Frameworks/R.framework/Versions
ls -al
```

31 列出目錄下所有檔案

```
total 8
drwxrwxr-x  5 root  admin  170  8 10 17:02 .
drwxrwxr-x  8 root  admin  272  8 10 17:02 ..
drwxrwxr-x  6 root  admin  204  8 11 22:08 3.0
drwxrwxr-x  6 root  admin  204  8 11 22:04 3.1
lrwxr-xr-x  1 root  admin    3  8 10 17:02 Current -> 3.1
```

電腦中已存在3.0, 3.1版本
現階段使用版本為3.1

macOS切換R版本

32 刪除目前的Current

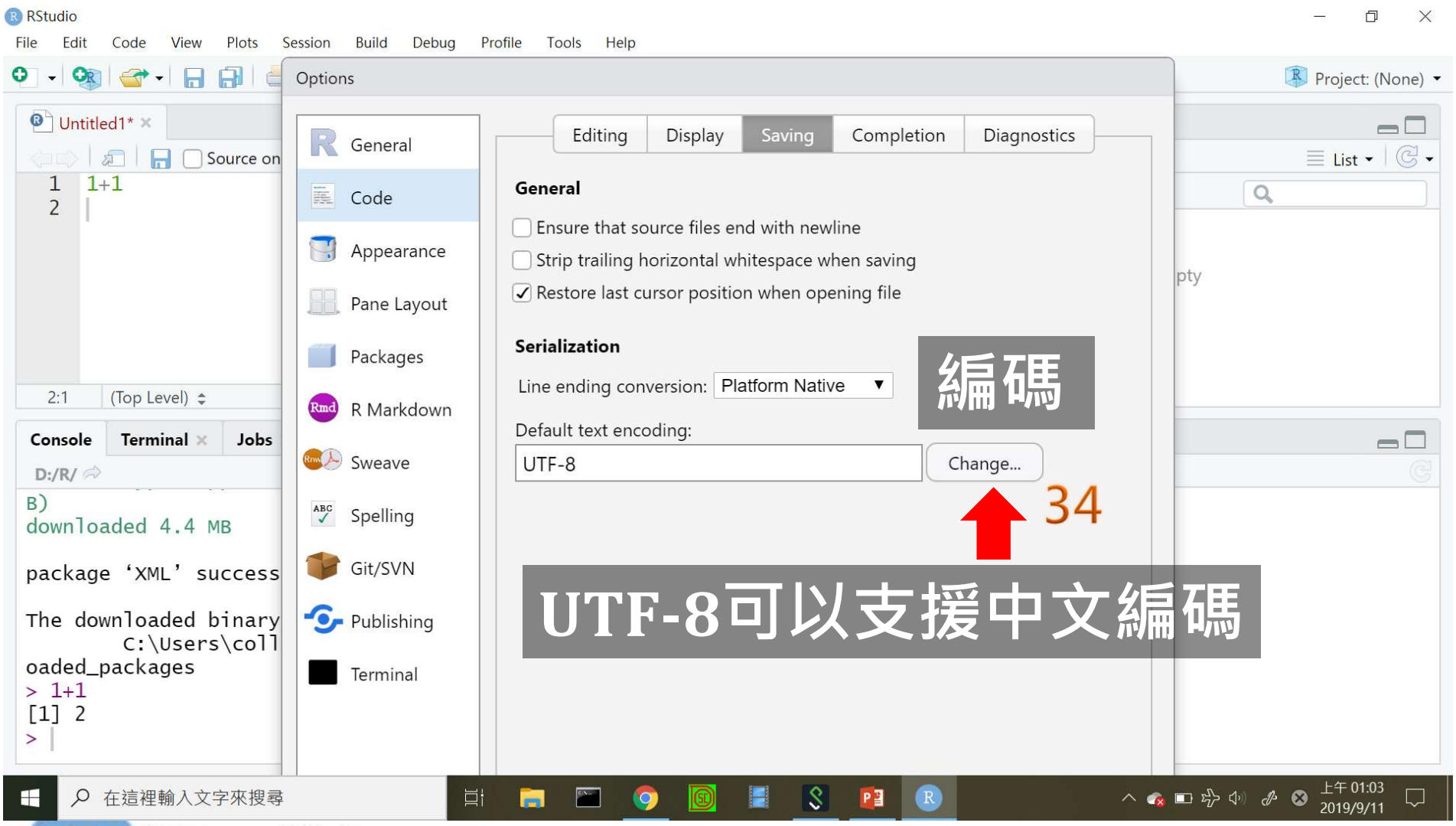
```
rm -rf Current
ls -al

total 0
drwxrwxr-x  4 root  admin  136  8 11 22:26 .
drwxrwxr-x  8 root  admin  272  8 10 17:02 ..
drwxrwxr-x  6 root  admin  204  8 11 22:08 3.0
drwxrwxr-x  6 root  admin  204  8 11 22:04 3.1
```

macOS切換R版本

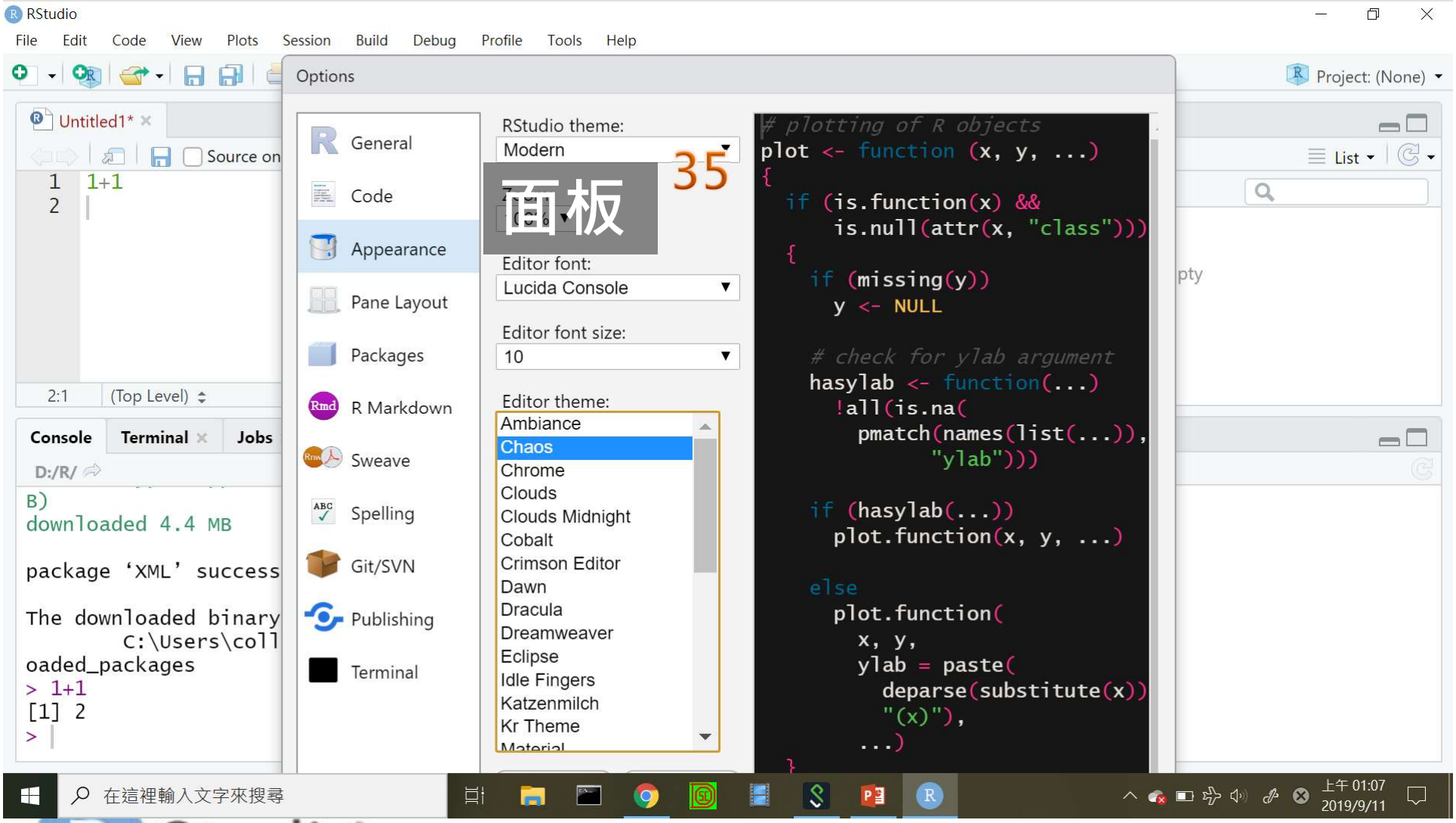
33 重新建立Current，並指向3.0版本

```
ln -s 3.0 Current
ls -al

total 8
drwxrwxr-x  5 root  admin  170  8 11 22:26 .
drwxrwxr-x  8 root  admin  272  8 10 17:02 ..
drwxrwxr-x  6 root  admin  204  8 11 22:08 3.0
drwxrwxr-x  6 root  admin  204  8 11 22:04 3.1
lrwxr-xr-x  1 joe   admin    3  8 11 22:26 Current -> 3.0
```

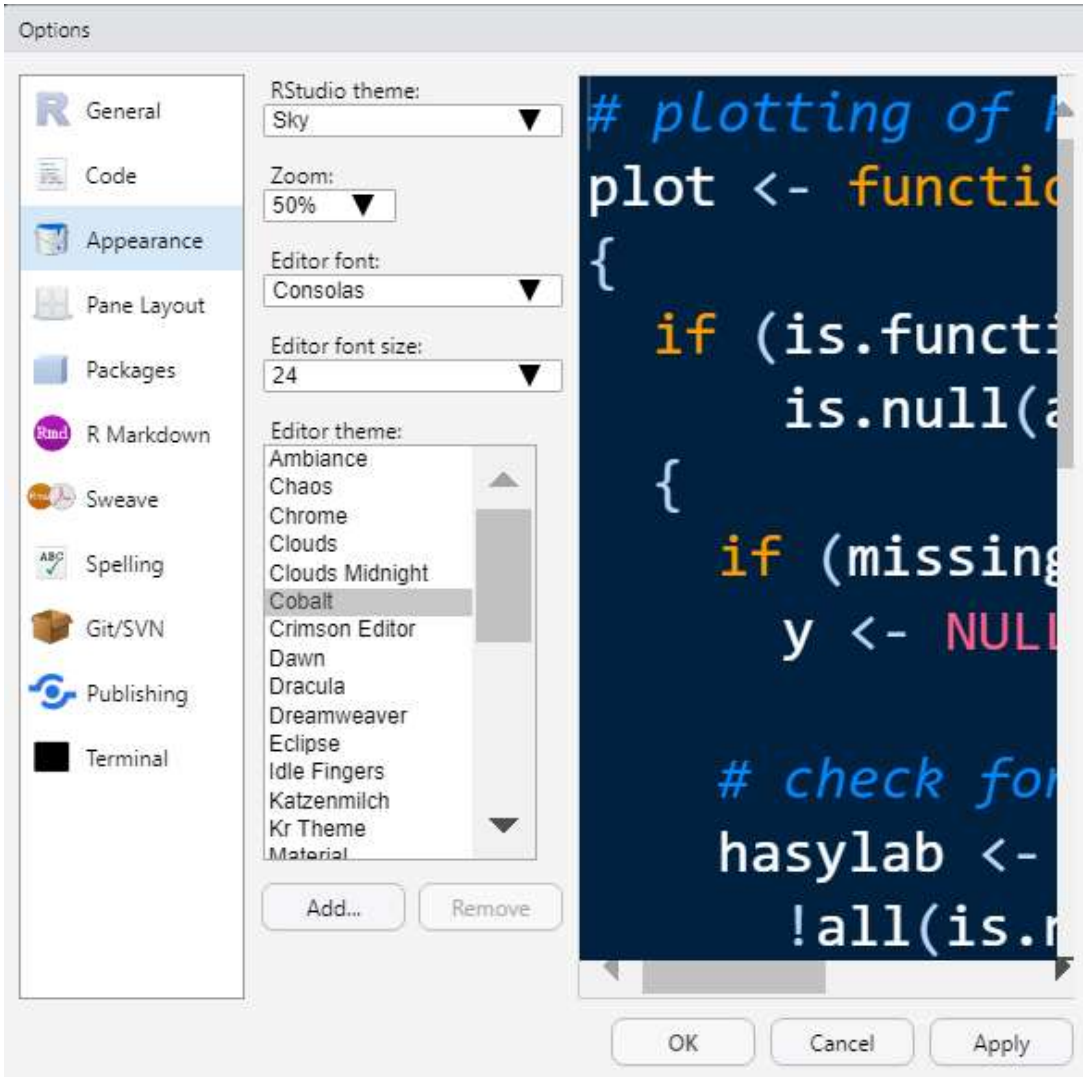
環境參數設定


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Options
General
Code
Appearance
Pane Layout
Packages
R Markdown
Sweave
Spelling
Git/SVN
Publishing
Terminal
Editing Display Saving Completion Diagnostics
General
Ensure that source files end with newline
Strip trailing horizontal whitespace when saving
Restore last cursor position when opening file
Serialization
Line ending conversion: Platform Native
Default text encoding:
UTF-8
Change...
編碼
34
UTF-8可以支援中文編碼
Untitled1*
1+1
Console Terminal Jobs
D:/R/
downloaded 4.4 MB
package 'XML' success
The downloaded binary
C:\Users\coll
oaded_packages
> 1+1
[1] 2
Project: (None)
List
在這裡輸入文字來搜尋
上午 01:03
2019/9/11

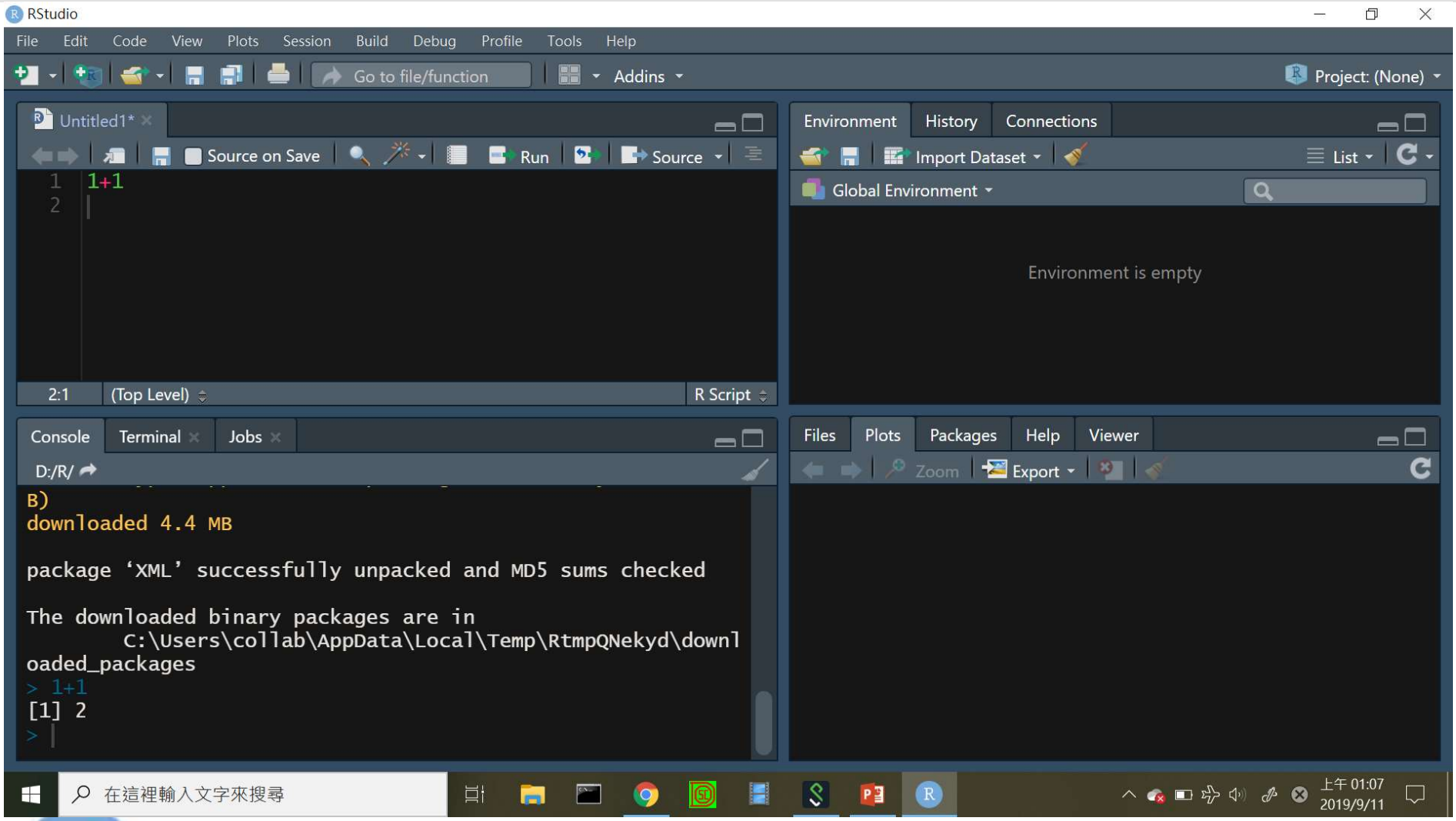
環境參數設定-面板樣式


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Options
General
Code
Appearance
Pane Layout
Packages
R Markdown
Sweave
Spelling
Git/SVN
Publishing
Terminal
RStudio theme:
Modern
35
面板
Editor font:
Lucida Console
Editor font size:
10
Editor theme:
Ambiance
Chaos
Chrome
Clouds
Clouds Midnight
Cobalt
Crimson Editor
Dawn
Dracula
Dreamweaver
Eclipse
Idle Fingers
Katzenmilch
Kr Theme
Material
# plotting of R objects
plot <- function (x, y, ...)
{
if (is.function(x) &&
is.null(attr(x, "class")))
{
if (missing(y))
y <- NULL
# check for ylab argument
hasylab <- function(...)
!all(is.na(
pmatch(names(list(...)),
"ylab")))
if (hasylab(...))
plot.function(x, y, ...)
else
plot.function(
x, y,
ylab = paste(
deparse(substitute(x))
"(x)"),
...)
}
Untitled1*
Source on
1+1
2:1 (Top Level)
Console Terminal Jobs
D:/R/
B)
downloaded 4.4 MB
package 'XML' success
The downloaded binary
C:\Users\coll
oaded_packages
> 1+1
[1] 2
>
Project: (None)
List
在這裡輸入文字來搜尋
上午 01:07
2019/9/11

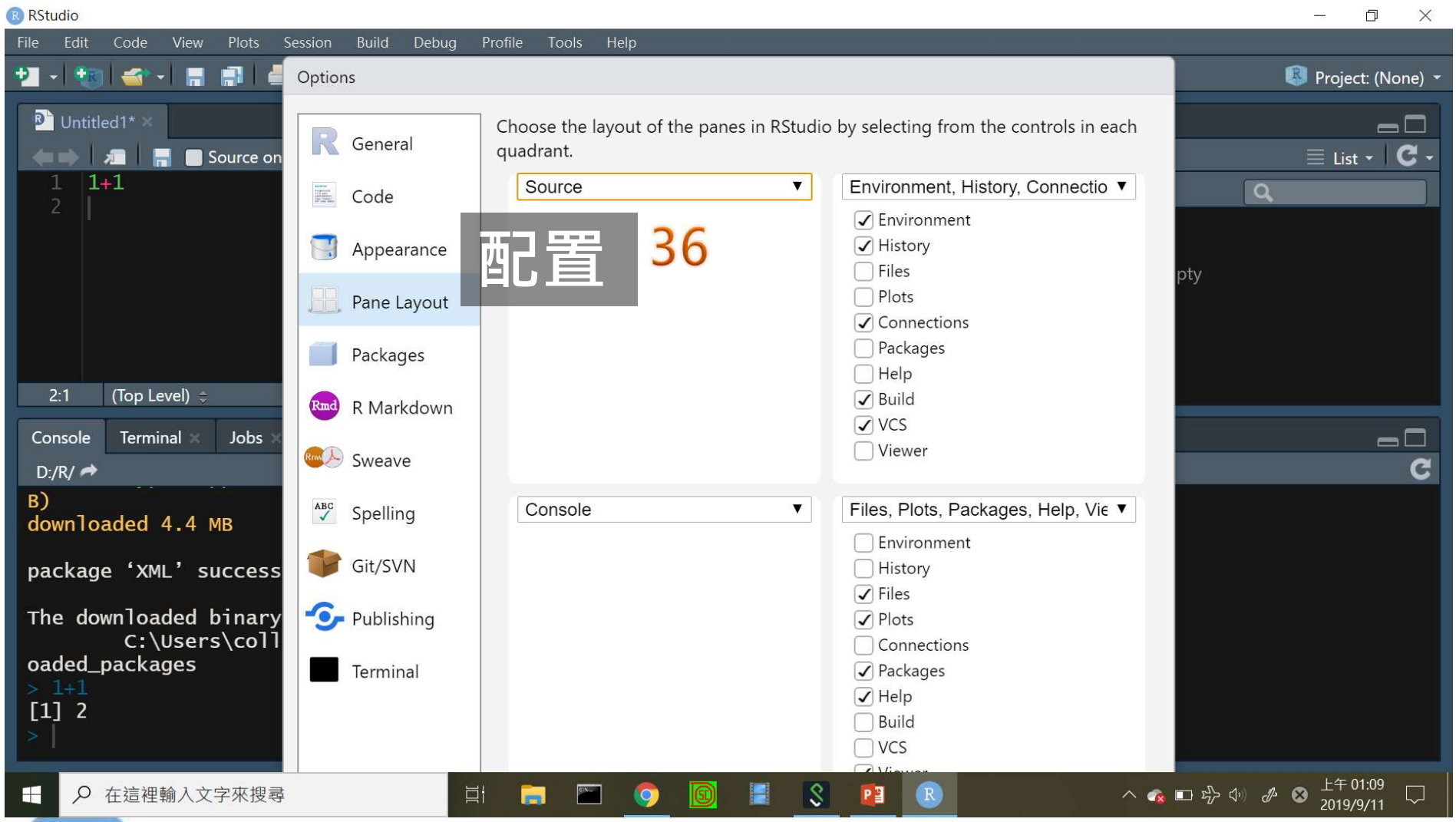
環境參數設定-面板樣式


Options
General
Code
Appearance
Pane Layout
Packages
R Markdown
Sweave
Spelling
Git/SVN
Publishing
Terminal
RStudio theme:
Sky
Zoom:
50%
Editor font:
Consolas
Editor font size:
24
Editor theme:
Ambiance
Chaos
Chrome
Clouds
Clouds Midnight
Cobalt
Crimson Editor
Dawn
Dracula
Dreamweaver
Eclipse
Idle Fingers
Katzenmilch
Kr Theme
Material
Add...
Remove
# plotting of
plot <- functio
{
if (is.functi
is.null(a
{
if (missing
y <- NULL
# check for
hasylab <-
!all(is.n
OK
Cancel
Apply

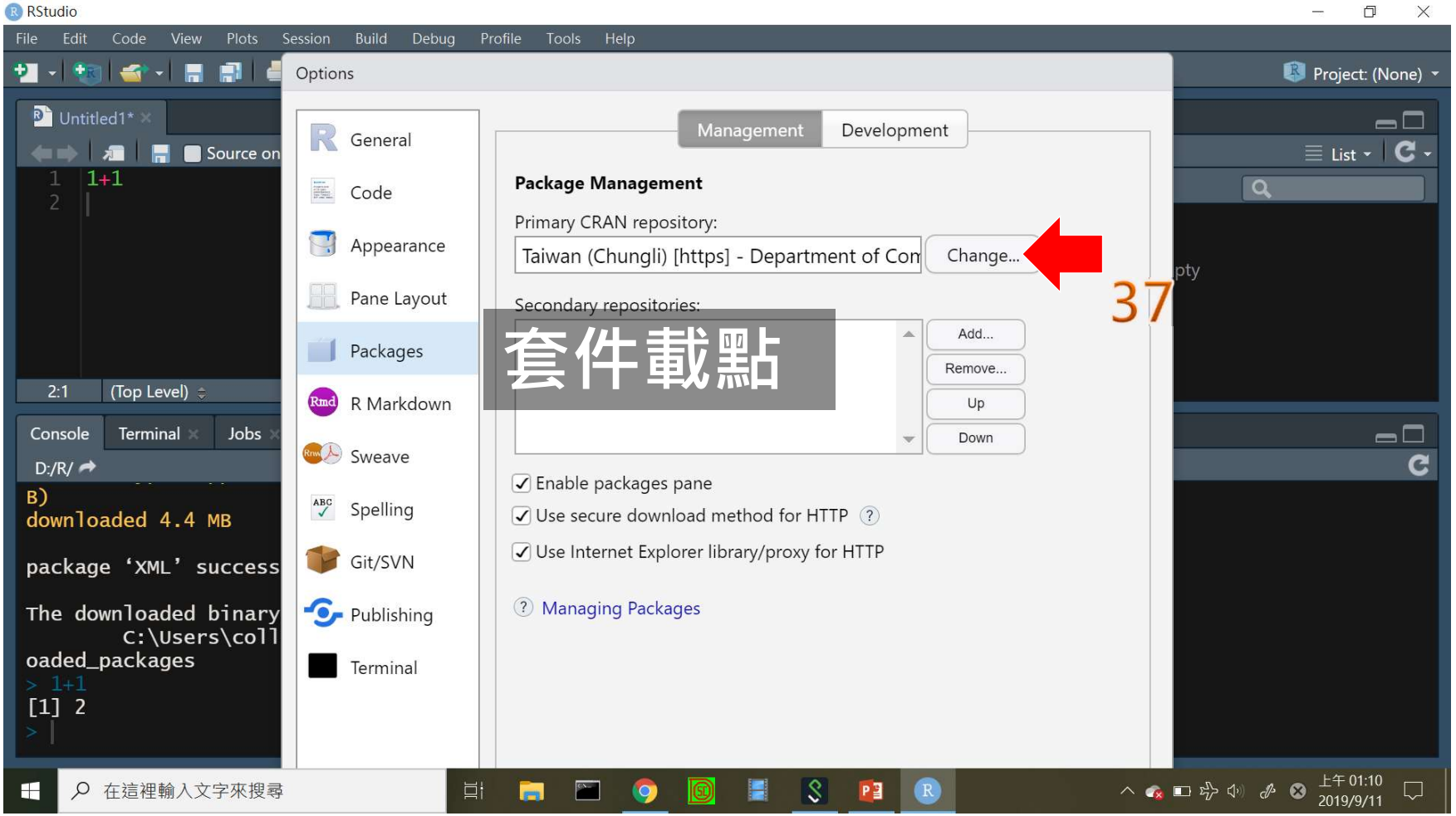
環境參數設定-面板樣式


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Untitled1*
Source on Save
Run
Source
1+1
2:1
(Top Level)
R Script
Environment
History
Connections
Import Dataset
List
Global Environment
Environment is empty
Console
Terminal
Jobs
D:/R/
B)
downloaded 4.4 MB
package 'XML' successfully unpacked and MD5 sums checked
The downloaded binary packages are in
C:\Users\collab\AppData\Local\Temp\RtmpQNekyd\downl
oaded_packages
> 1+1
[1] 2
Files
Plots
Packages
Help
Viewer
Zoom
Export
在這裡輸入文字來搜尋
上午 01:07
2019/9/11

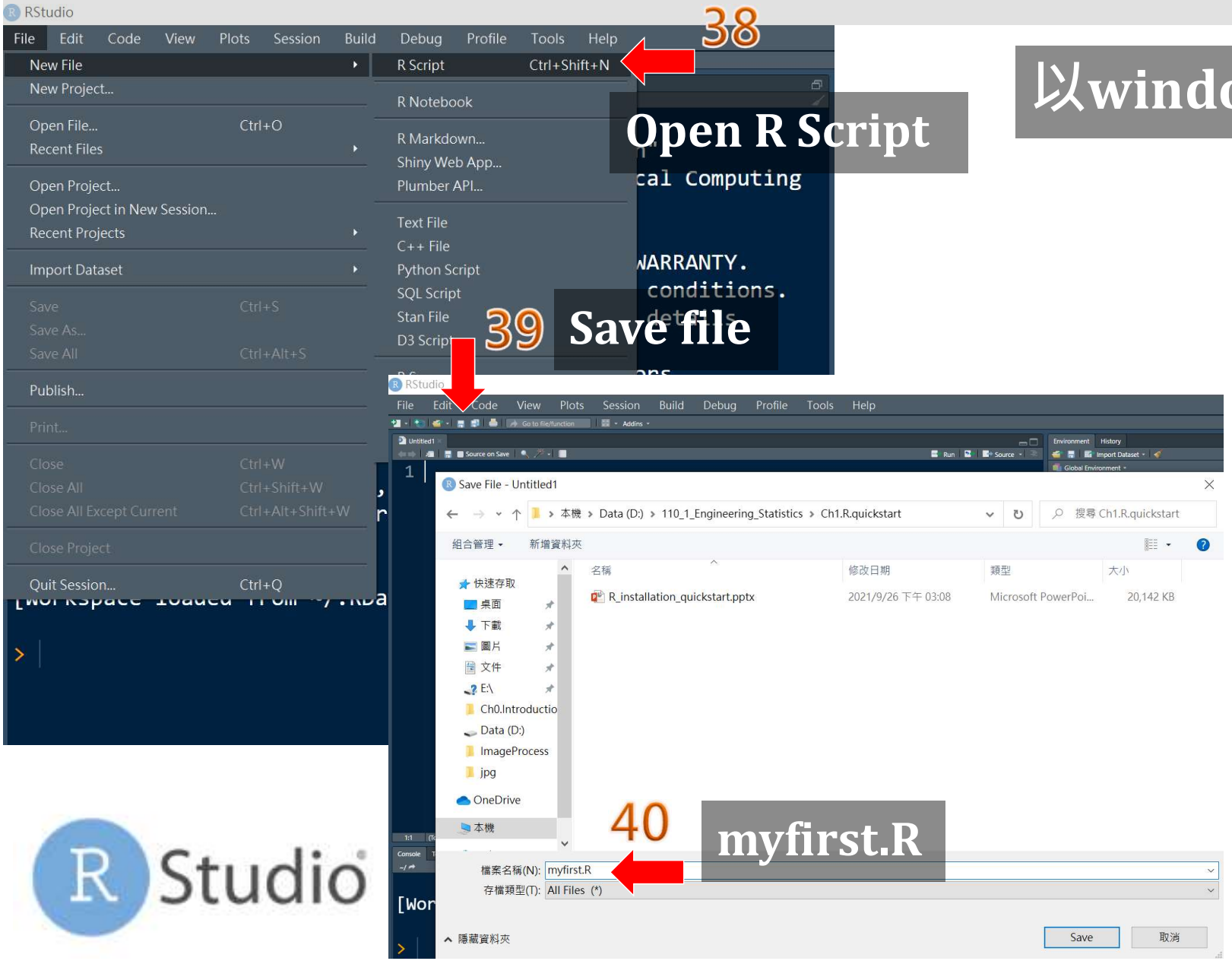
環境參數設定-面板配置


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Options
General
Code
Appearance
Pane Layout
Packages
R Markdown
Sweave
Spelling
Git/SVN
Publishing
Terminal
配置
36
Choose the layout of the panes in RStudio by selecting from the controls in each quadrant.
Source
Environment, History, Connectio
Environment
History
Files
Plots
Connections
Packages
Help
Build
VCS
Viewer
Console
Files, Plots, Packages, Help, Vie
Environment
History
Files
Plots
Connections
Packages
Help
Build
VCS
Project: (None)
Untitled1*
Source on
1+1
2:1
(Top Level)
Console
Terminal
Jobs
D:/R/
B)
downloaded 4.4 MB
package 'XML' success
The downloaded binary
C:\Users\coll
oaded_packages
> 1+1
[1] 2
>
List
pty
在這裡輸入文字來搜尋
上午 01:09
2019/9/11

環境參數設定-套件載點


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Options
General
Code
Appearance
Pane Layout
Packages
R Markdown
Sweave
Spelling
Git/SVN
Publishing
Terminal
Management
Development
Package Management
Primary CRAN repository:
Taiwan (Chungli) [https] - Department of Com
Change...
Secondary repositories:
Add...
Remove...
Up
Down
Enable packages pane
Use secure download method for HTTP
Use Internet Explorer library/proxy for HTTP
Managing Packages
套件載點
37
Project: (None)
Untitled1*
Source on
1+1
2:1
(Top Level)
Console
Terminal
Jobs
D:/R/
downloaded 4.4 MB
package 'XML' success
The downloaded binary
C:\Users\coll
oaded_packages
> 1+1
[1] 2
在這裡輸入文字來搜尋
上午 01:10
2019/9/11

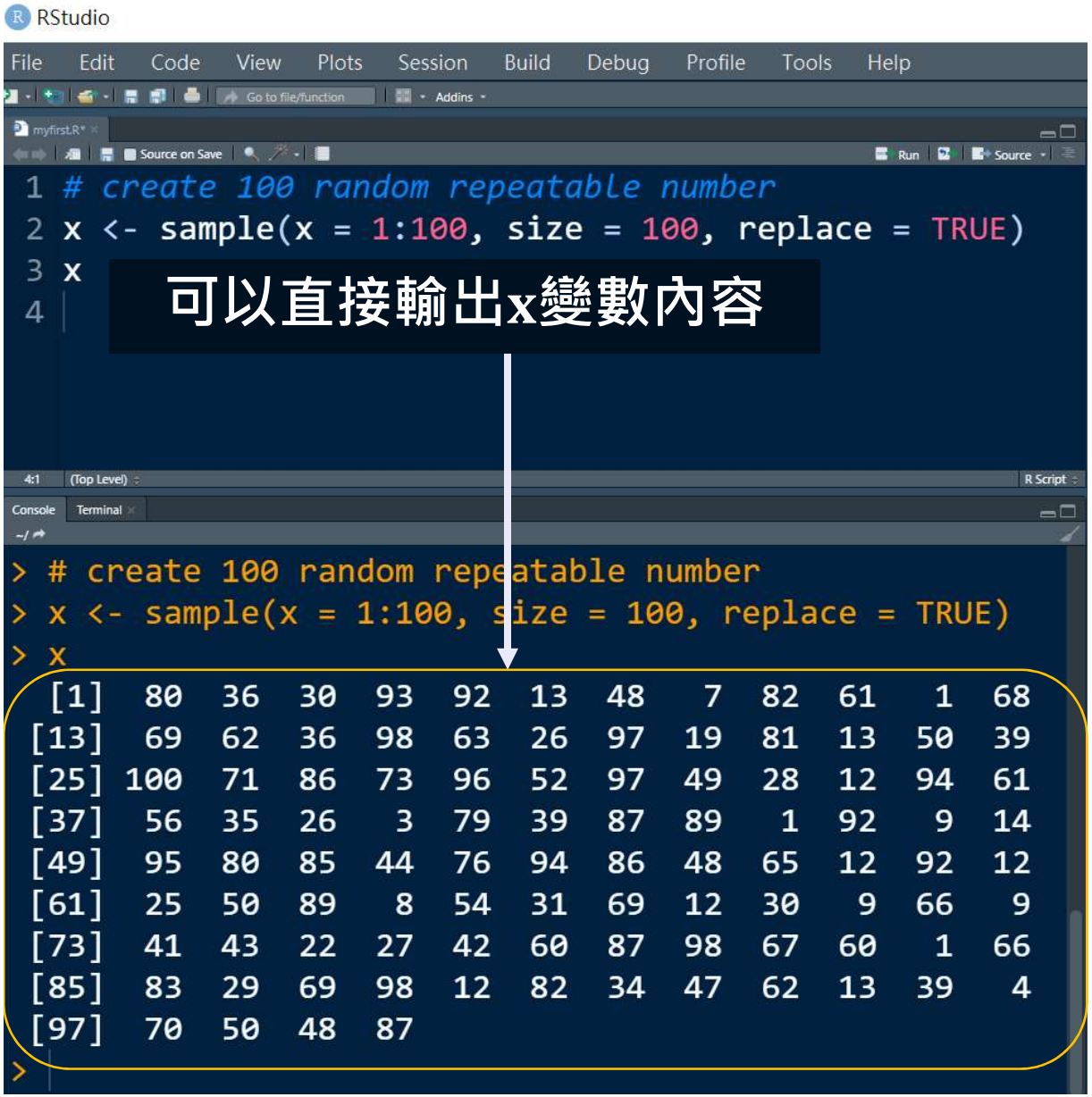
第一個R語言撰寫-儲存R檔



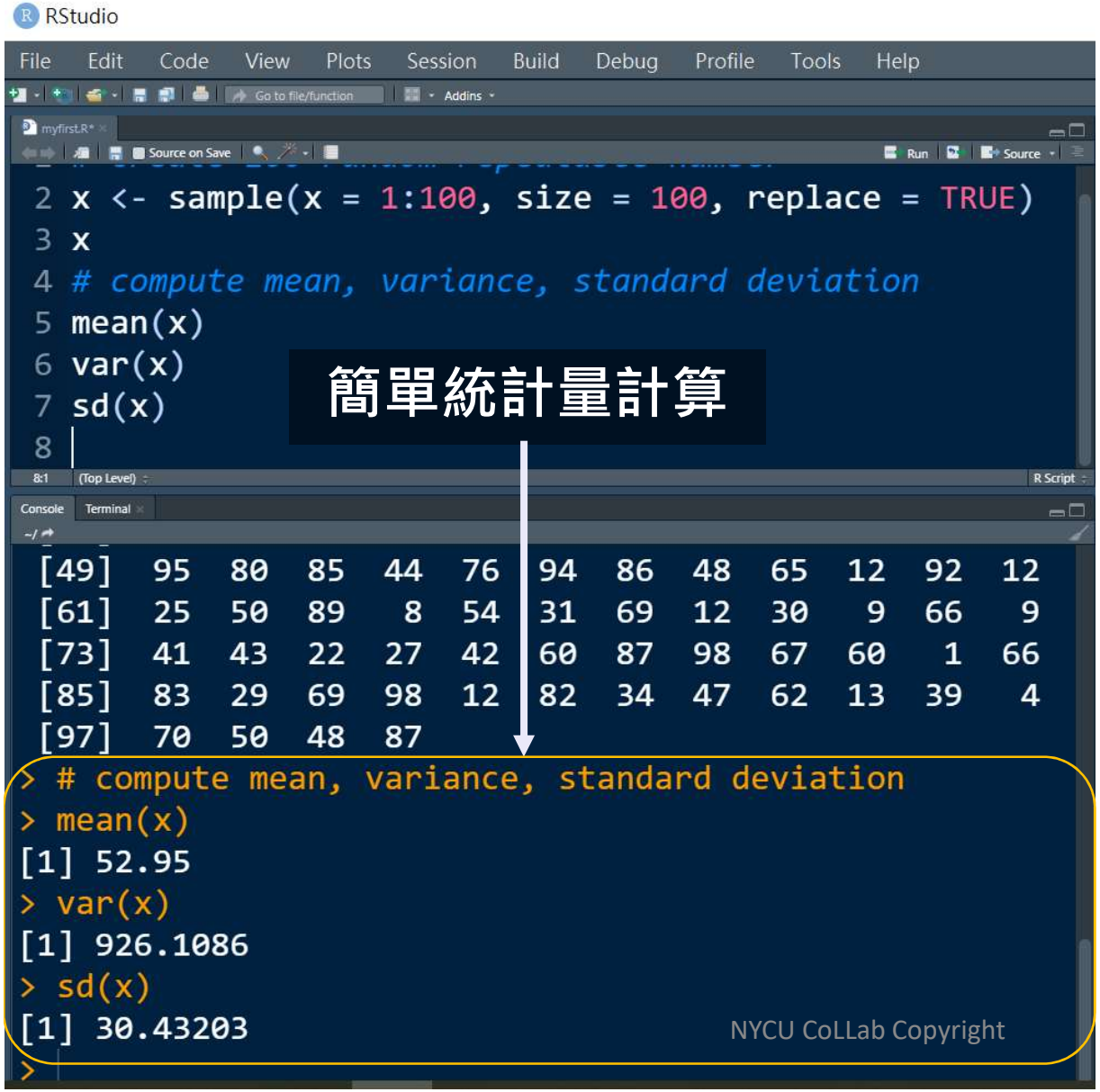
以windows為例

第一個R語言撰寫-隨機亂數

第一個R語言撰寫-隨機亂數

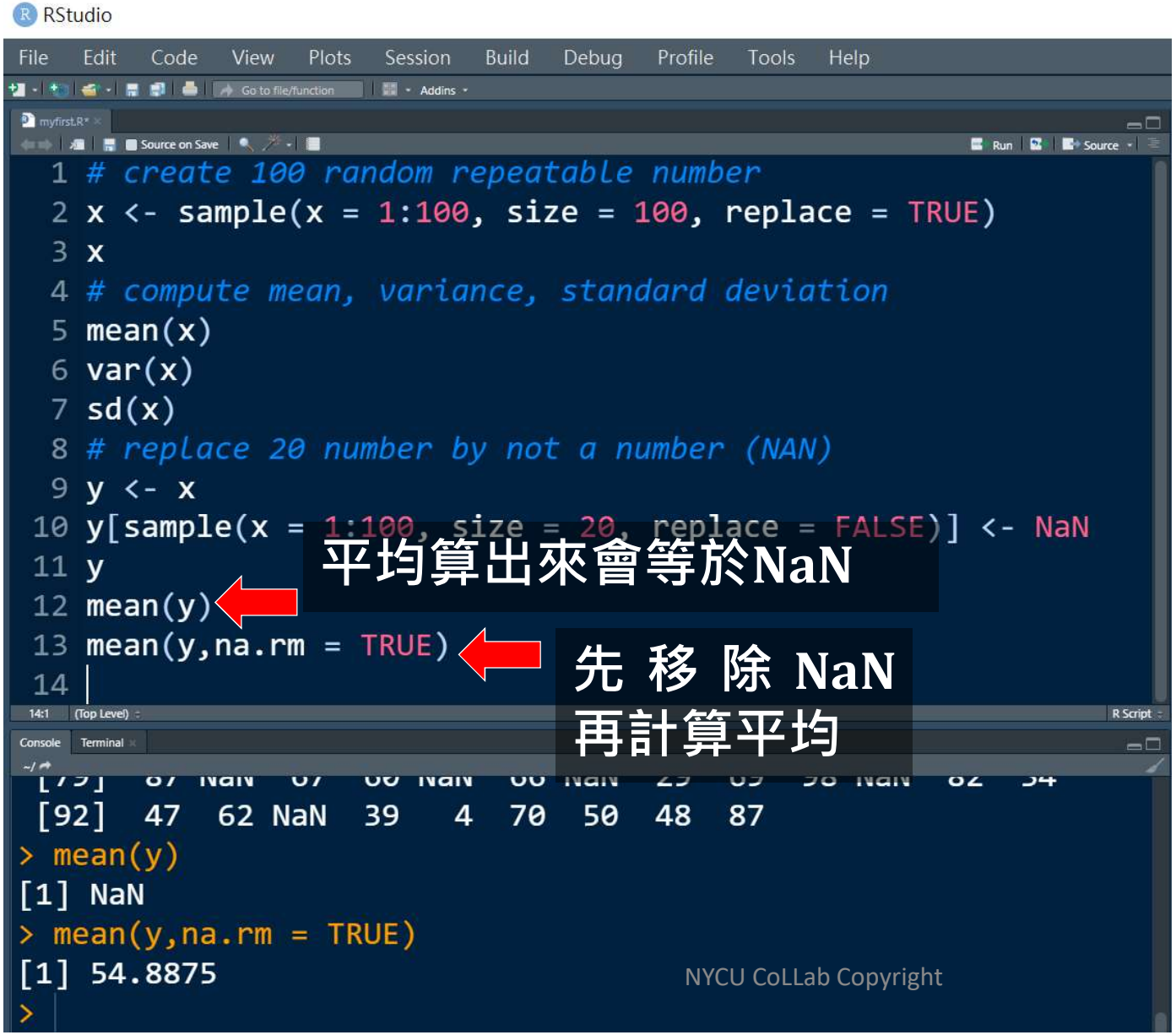


第一個R語言撰寫-隨機亂數



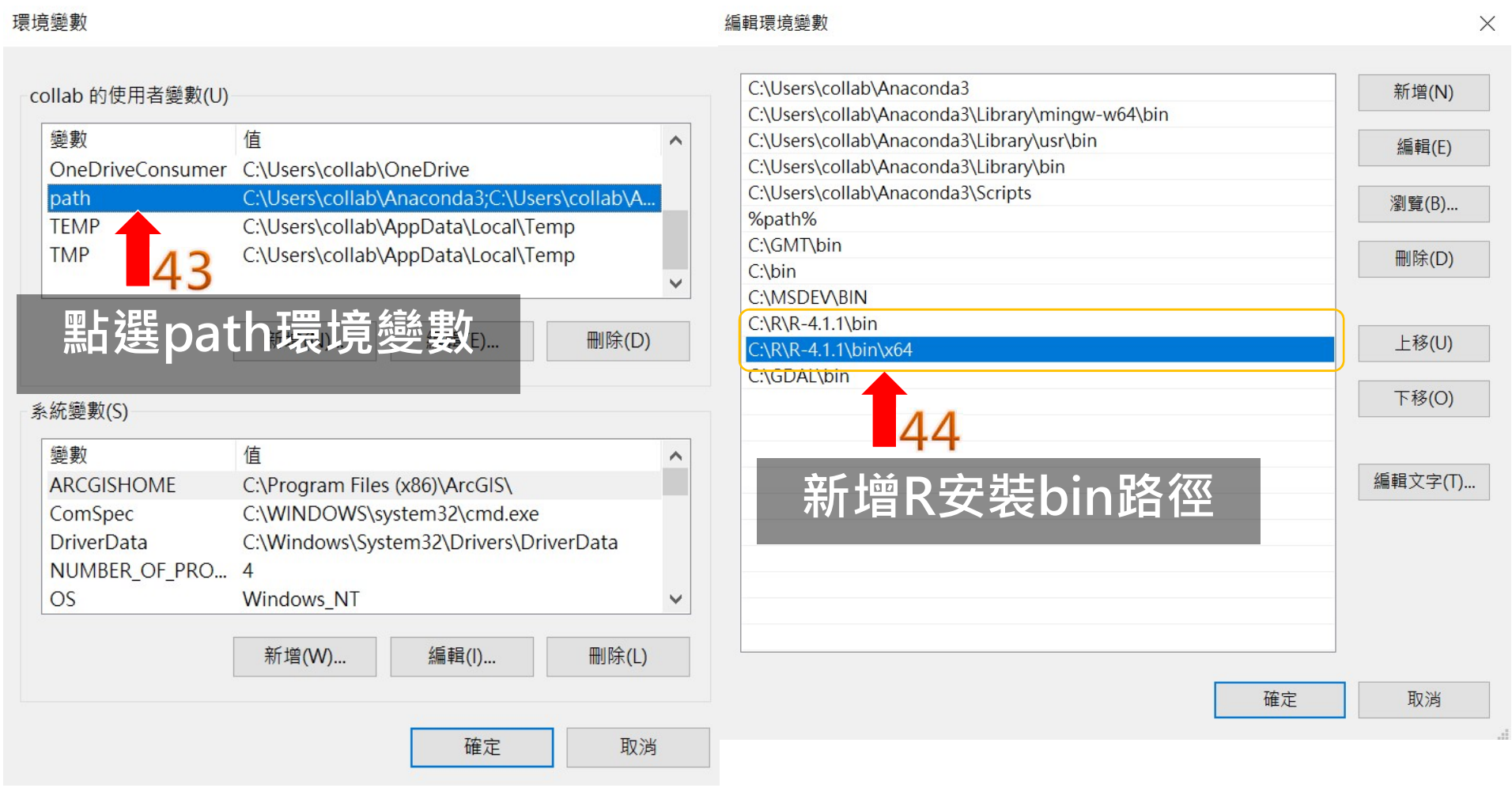
第一個R語言撰寫-隨機亂數

第一個R語言撰寫-NAN處理

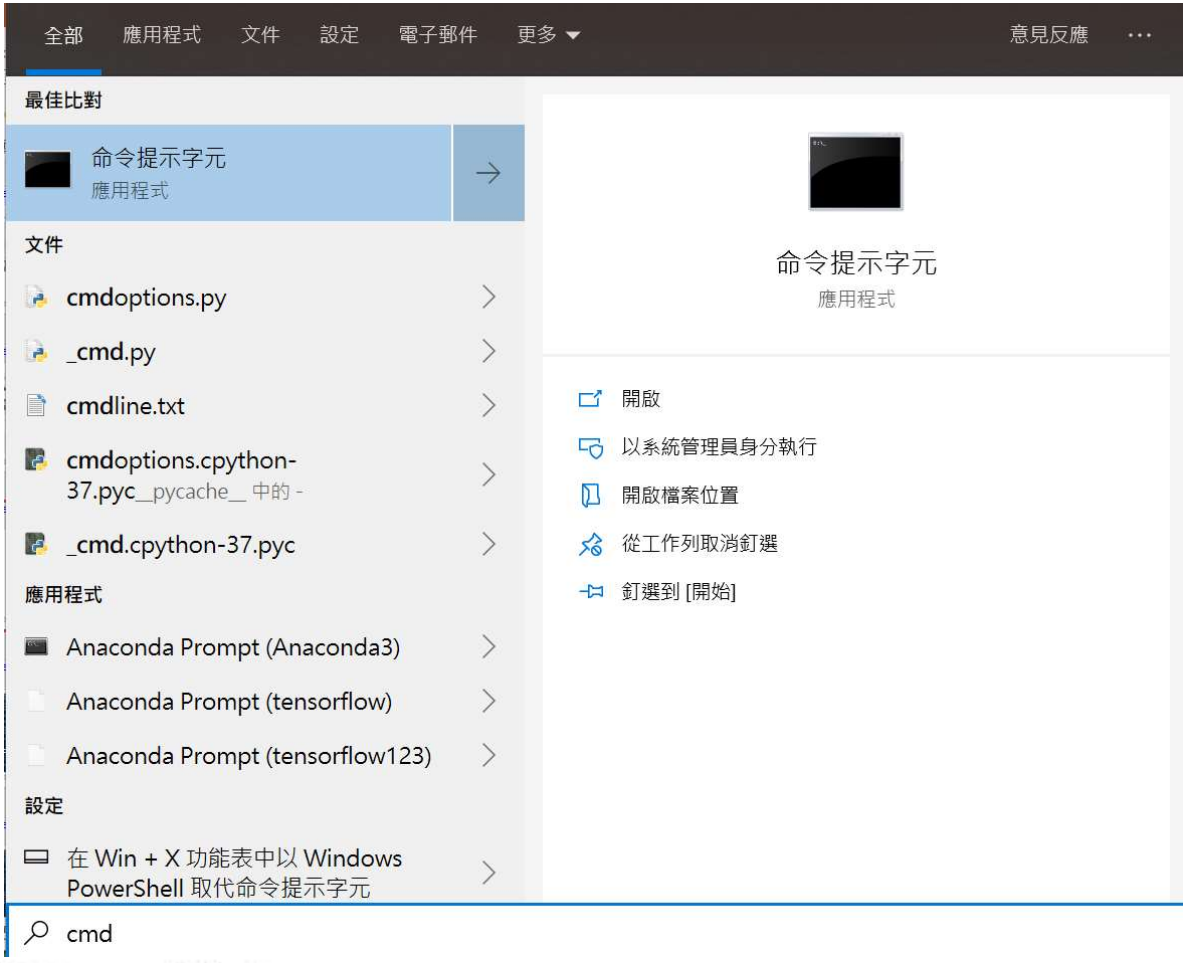


使用CMD或Terminal執行R檔

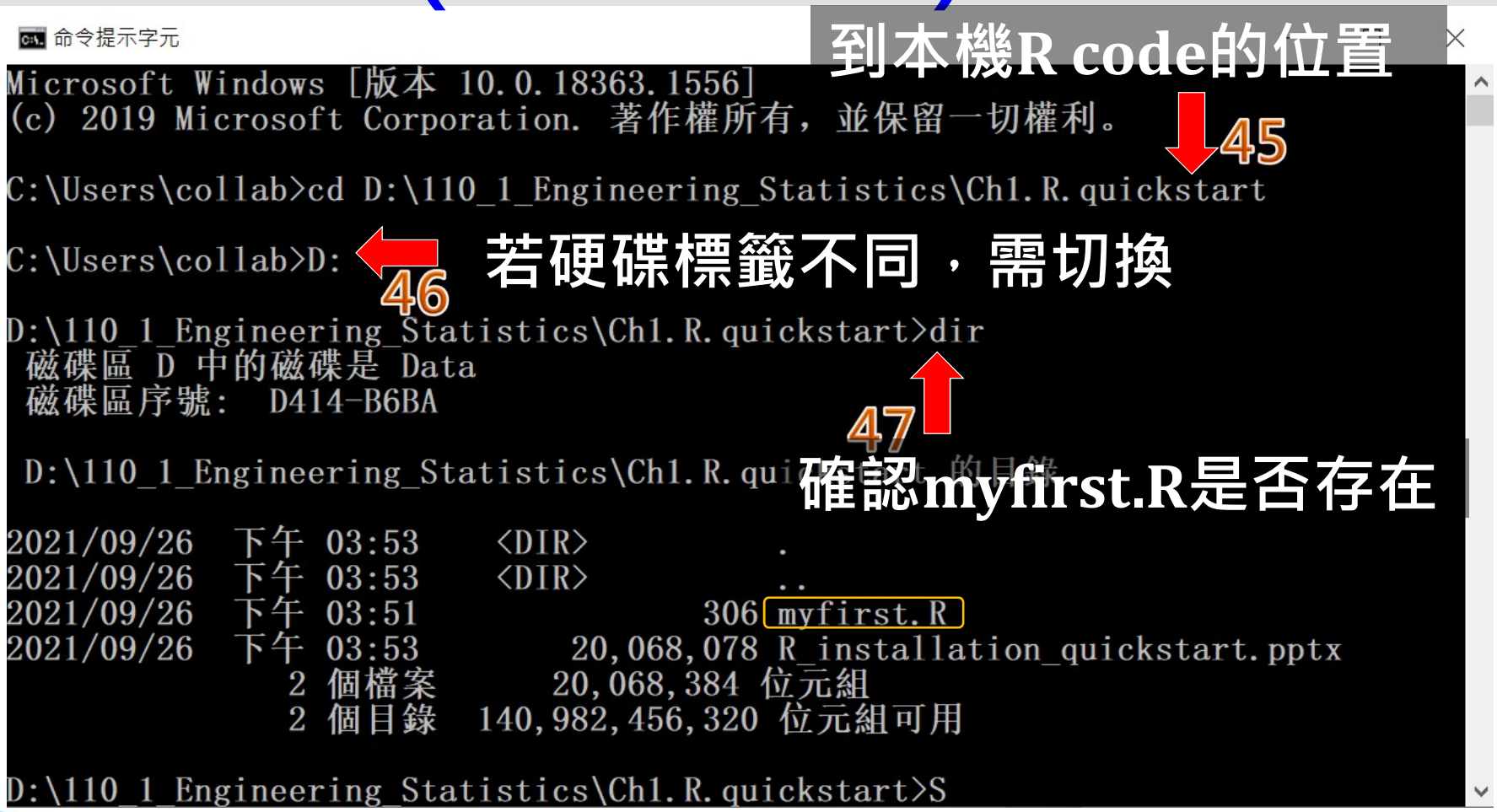
使用CMD或Terminal執行R檔



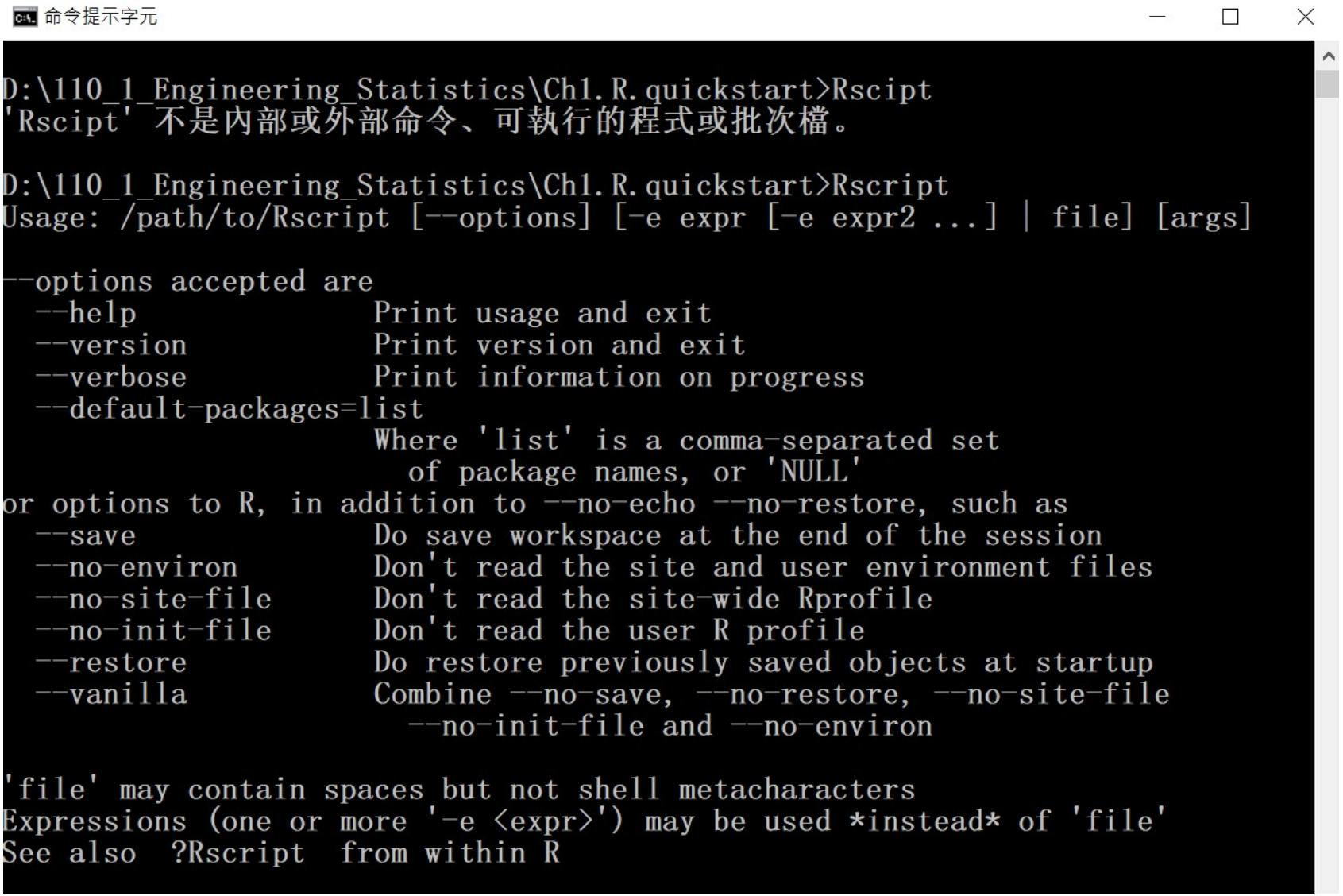
使用CMD或Terminal執行R檔 (Windows)



使用CMD或Terminal執行R檔 (Windows)



使用CMD或Terminal執行R檔(Windows)-Rscript



使用CMD或Terminal執行R檔(Windows)-Rscript

48 **Command line: Rscript myfirst.R**

```
D:\110_1_Engineering_Statistics\Ch1.R.quickstart>Rscript myfirst.R
  [1]  92  17  62  59  49  49  35  64  34  48  47  63  90  63  77  39  91   3
 [19]  23  53  34  24  73  39   7   2  58  73  73  19  94  21  16  91  69  62
 [37]   4  53  16   2  33  53  12  24  59  22  65  82  73  19  24  19  49  74
 [55]  38   3  13  44  62 100  38  97  75  33  89  49  39  11  20  83  38  75
 [73]  23  62  45  19  34   4  26  23  60  41  88  95  80  28  46  85   5   8
 [91]   1  53  85  70  70  70  86   3  80  49
[1] 47.42
[1] 795.0541
[1] 28.1967
  [1]  92 NaN  62  59  49  49  35  64  34  48  47  63  90  63  77  39  91   3
 [19] NaN  53  34 NaN  73  39 NaN   2 NaN  73  73  19  94  21 NaN NaN  69  62
 [37]   4  53  16   2  33  53  12  24  59 NaN NaN NaN  73 NaN  24  19  49 NaN
 [55]  38   3  13  44  62 100  38 NaN  75 NaN  89 NaN NaN  11  20  83  38  75
 [73] NaN  62  45 NaN  34   4  26 NaN  60  41  88  95  80  28  46  85   5   8
 [91]   1  53 NaN  70  70  70  86   3  80  49
[1] NaN
[1] 48.45

D:\110_1_Engineering_Statistics\Ch1.R.quickstart>_
```

使用CMD或Terminal執行R檔(Windows)-Rscript

49

Rscript myfirst.R > output.txt

命令提示字元

```
[1] 48.45

D:\110_1_Engineering_Statistics\Ch1.R.quickstart>Rscript myfirst.R > output.txt

D:\110_1_Engineering_Statistics\Ch1.R.quickstart>
```

Crimson Editor - [D:\110_1_Engineering_Statistics\Ch1.R.quickstart\output.txt]

File Edit Search View Document Project Tools Macros Window Help

output.txt

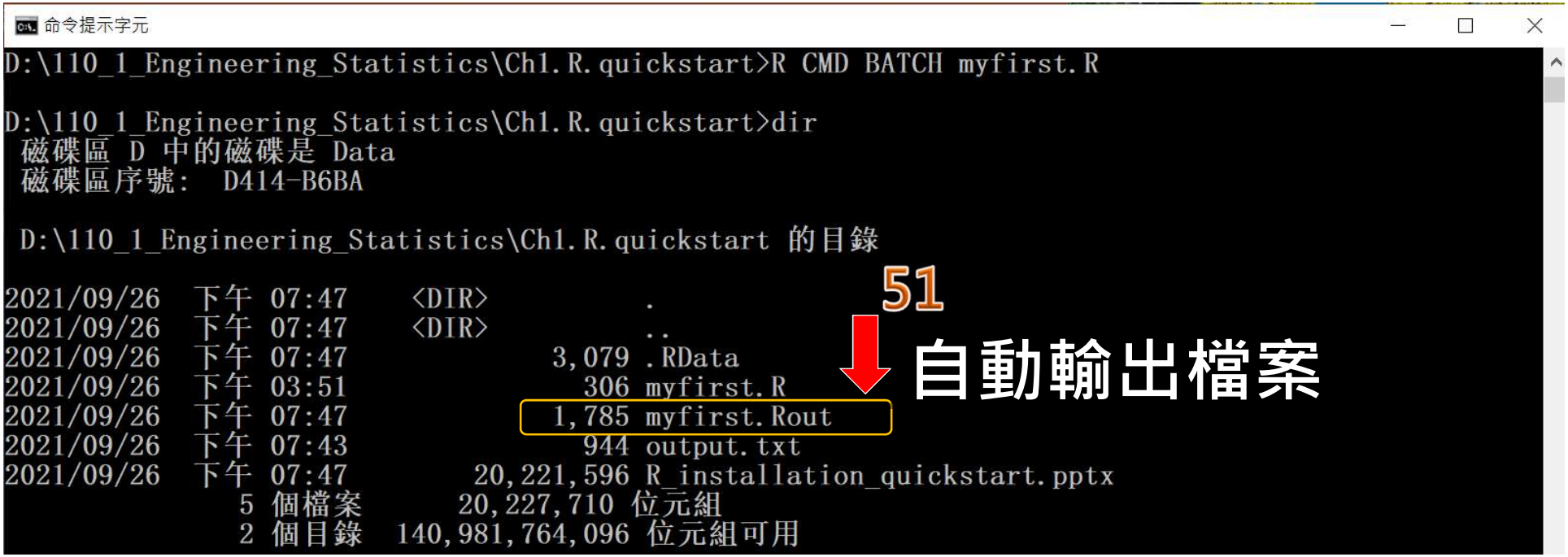
```
 1   [1]  40  19  84  52  48   8  29  68  92  60  81  29  73  79  54  42  13  48
 2  [19]  71  59  57  25  12  63  79  82   4  90  58  95  97  20  12  36   1  93
 3  [37]  11  41   2   4  40  85  71  13  18  88  74  37  95  67  41  54  26  79
 4  [55]  25   2  91  90  93  60  36  10  24  38   5  45  58  65  63  98  68  31
 5  [73]  65  88 100  24  82  44  36  30  55   3  82  73  21   1  51   9  17  87
 6  [91]  65  72  25  59  13  93  36  88  74  46
 7 [1] 50.6
 8 [1] 881.7172
 9 [1] 29.69372
10   [1]  40  19  84  52 NaN   8  29  68  92  60  81  29  73  79  54  42 NaN  48
11  [19]  71  59  57  25  12  63  79  82   4  90  58 NaN  97  20  12 NaN   1  93
12  [37]  11  41   2   4 NaN NaN  71 NaN NaN  88  74  37  95  67  41  54  26  79
13  [55]  25 NaN  91  90  93  60  36  10  24  38   5  45  58  65 NaN  98 NaN NaN
14  [73]  65  88 NaN NaN  82  44 NaN NaN  55   3  82  73 NaN NaN  51   9  17  87
15  [91]  65  72  25 NaN  13  93  36  88 NaN  46
16 [1] NaN
17 [1] 52.5375
18
```

RStudio

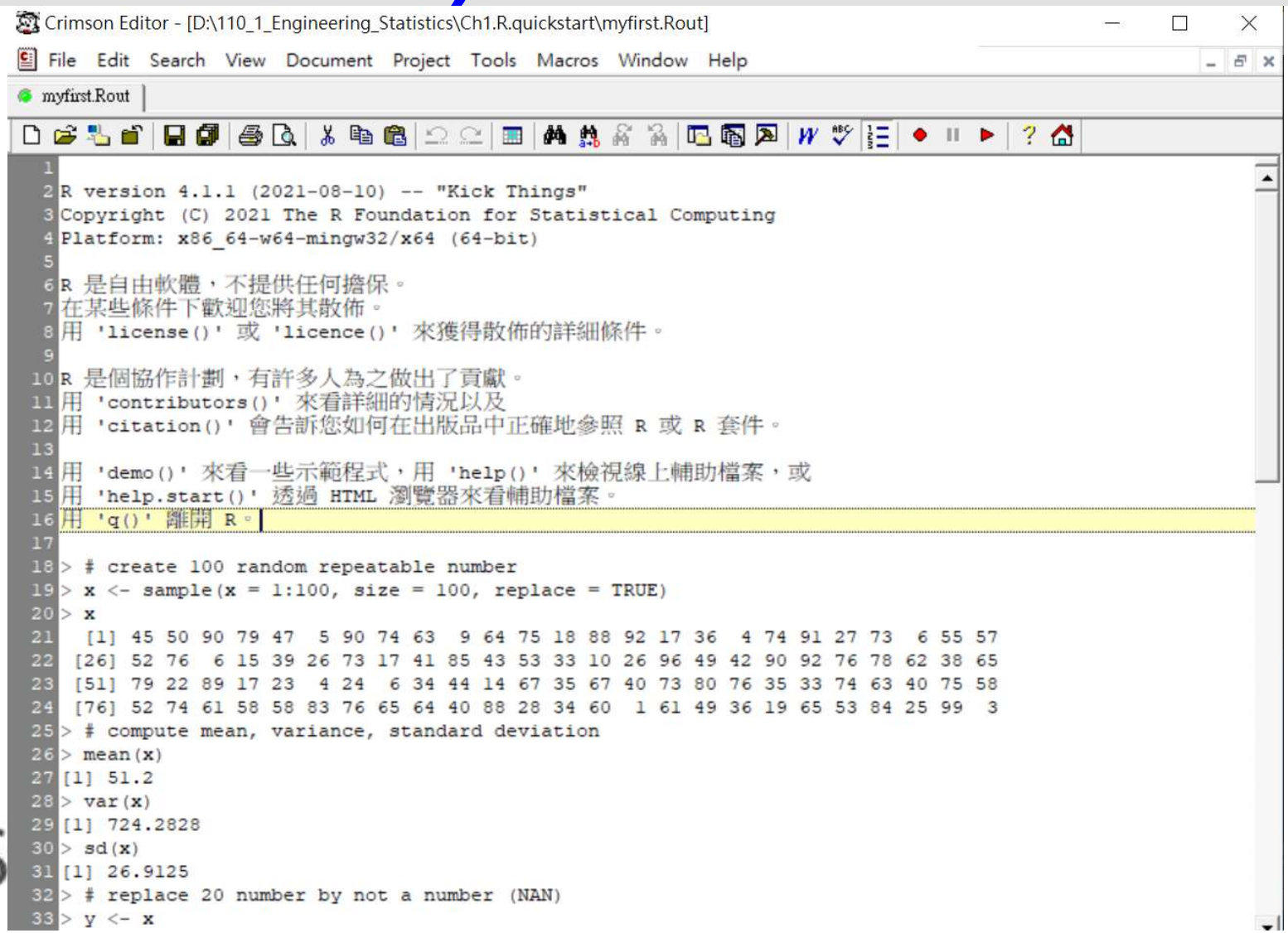
使用CMD或Terminal執行R檔(Windows)-R CMD BATCH

50

```
R CMD BATCH myfirst.R
```



使用CMD或Terminal執行R檔 (Windows)-R CMD BATCH



使用CMD或Terminal執行R檔(Windows)-R CMD BATCH

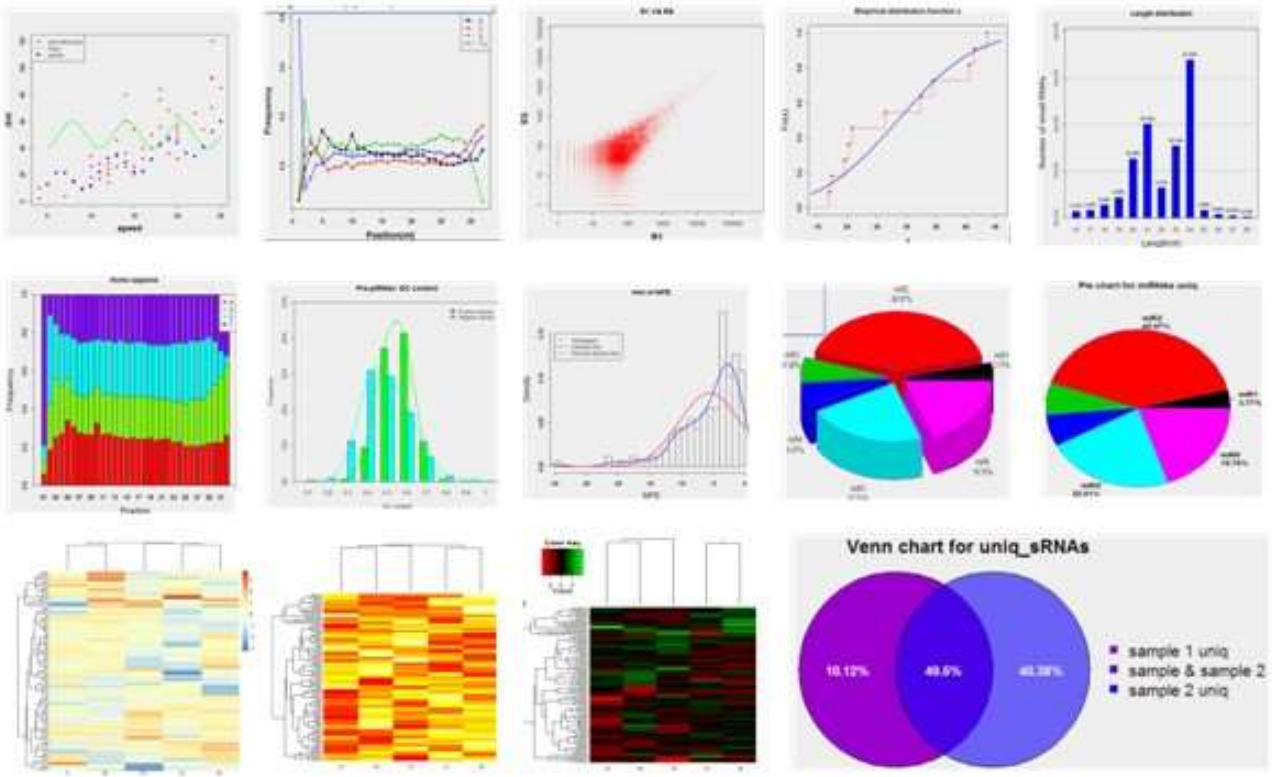
```
> y[sample(x = 1:100, size = 20, replace = FALSE)] <- NaN
> y
  [1]  45 NaN  90  79  47 NaN  90  74  63   9 NaN  75  18 NaN  92  17  36   4
 [19]  74 NaN  27  73 NaN NaN  57  52 NaN   6  15  39  26 NaN  17 NaN  85  43
 [37]  53 NaN NaN  26 NaN  49  42  90 NaN  76  78  62  38  65  79  22  89  17
 [55]  23   4  24   6  34  44  14  67  35  67 NaN  73  80  76  35  33  74 NaN
 [73]  40  75  58 NaN  74  61  58 NaN  83  76 NaN  64  40  88  28  34  60   1
 [91]  61  49  36  19  65  53 NaN  25  99   3
> mean(y)
[1] NaN
> mean(y,na.rm = TRUE)
[1] 49.725
>
> proc.time()
使用者    系統    流逝
  0.14    0.09    0.21

```

使用者時間與CPU時間

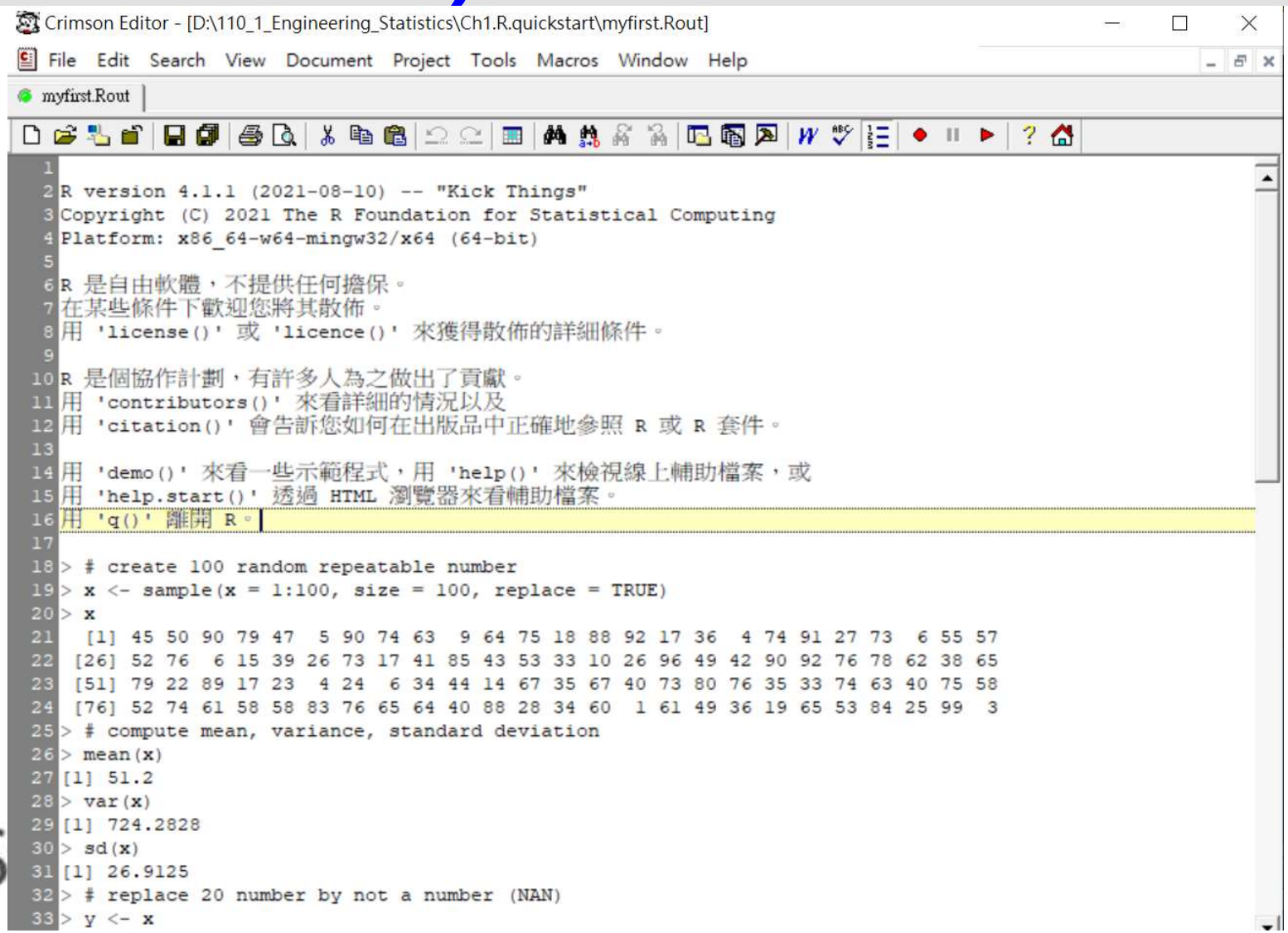
CMD直接切換R執行程序環境-(Windows)- Rterm

The R Project for Statistical Computing

歡迎加入R語言世界



使用CMD或Terminal執行R檔 (Windows)-R CMD BATCH



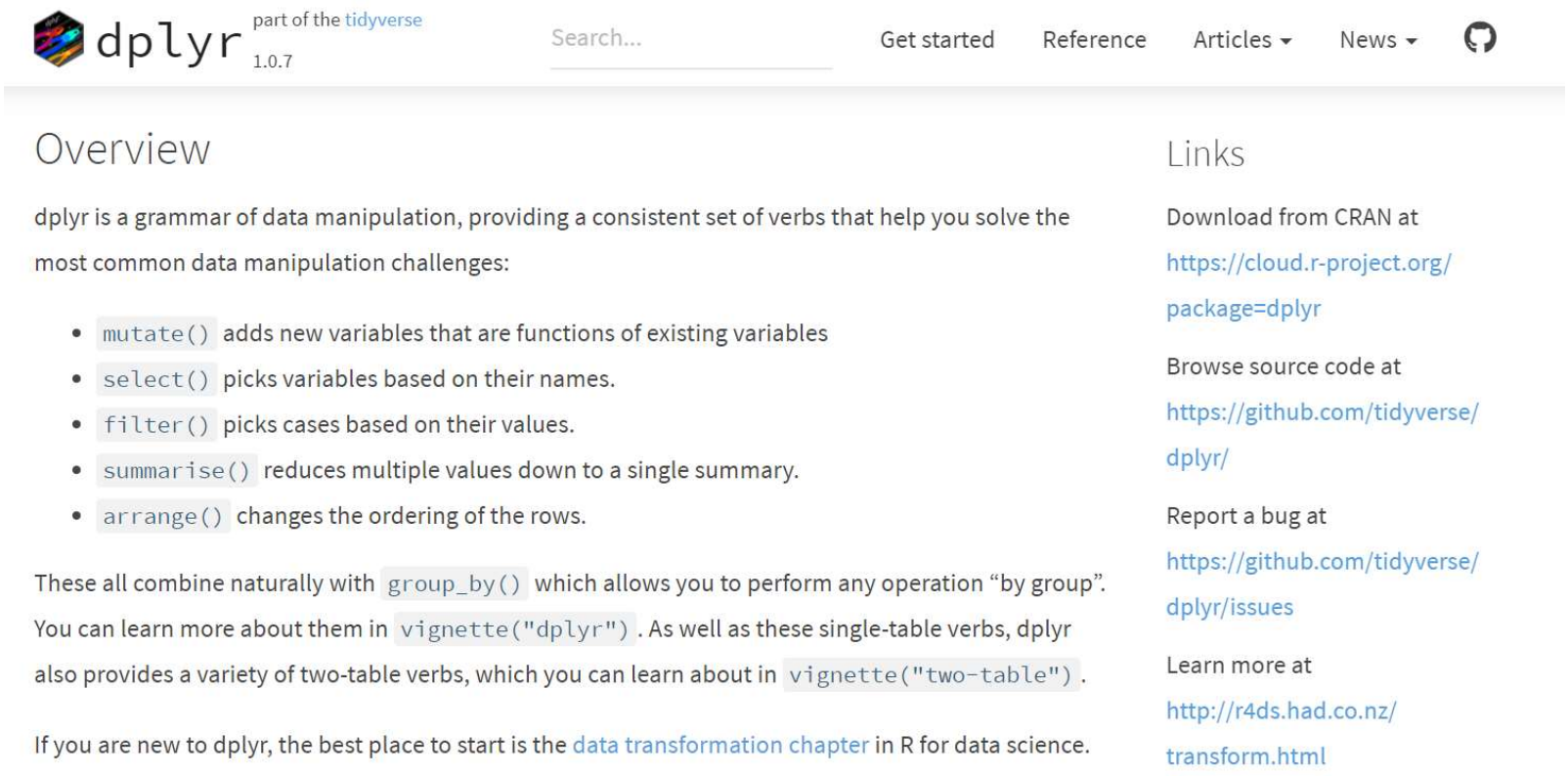
Quick Demo R – dplyr + Linear regression + ggplot2

dplyr is a grammar of data manipulation, providing a consistent set of verbs that help you solve the most common data manipulation challenges.

dplyr()
gapminder()

https://www.youtube.com/watch?v=jbkSRLYSojo
Hans Rosling's 200 Countries, 200 Years, 4 Minutes - The Joy of Stats - BBC Four

https://dplyr.tidyverse.org/



Quick Demo R – dplyr + Linear regression + ggplot2

https://www.rdocumentation.org/packages/gapminder/versions/0.3.0

dplyr()

gapminder()

gapminder

Excerpt from the Gapminder data. The main object in this package is the `gapminder` data frame or "tibble". There are other goodies, such as the data in tab delimited form, a larger unfiltered dataset, premade color schemes for the countries and continents, and ISO 3166-1 country codes.

The `gapminder` data frames include six variables, (Gapminder.org documentation page):

variable	meaning
country	
continent	
year	
lifeExp	life expectancy at birth
pop	total population
gdpPercap	per-capita GDP

Quick Demo R – dplyr + Linear regression + ggplot2

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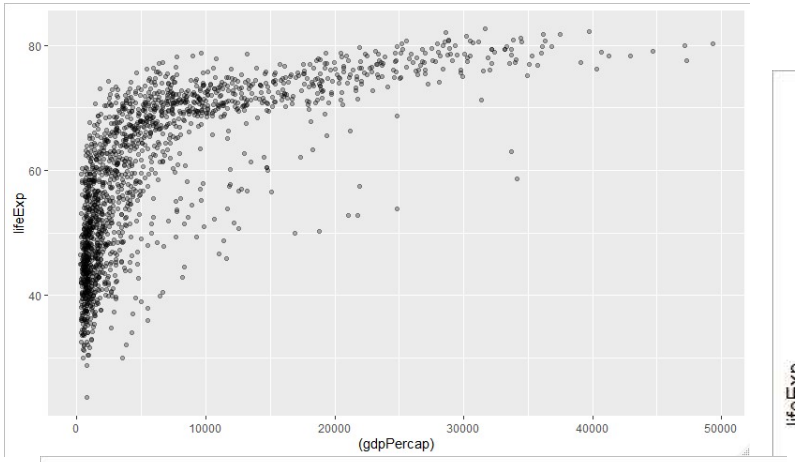

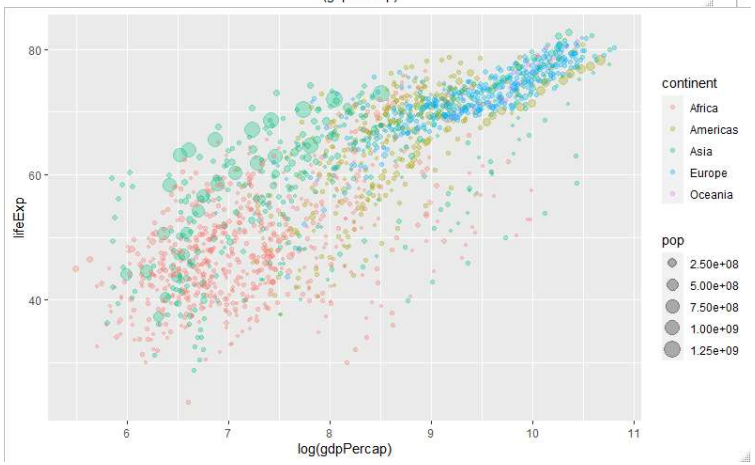

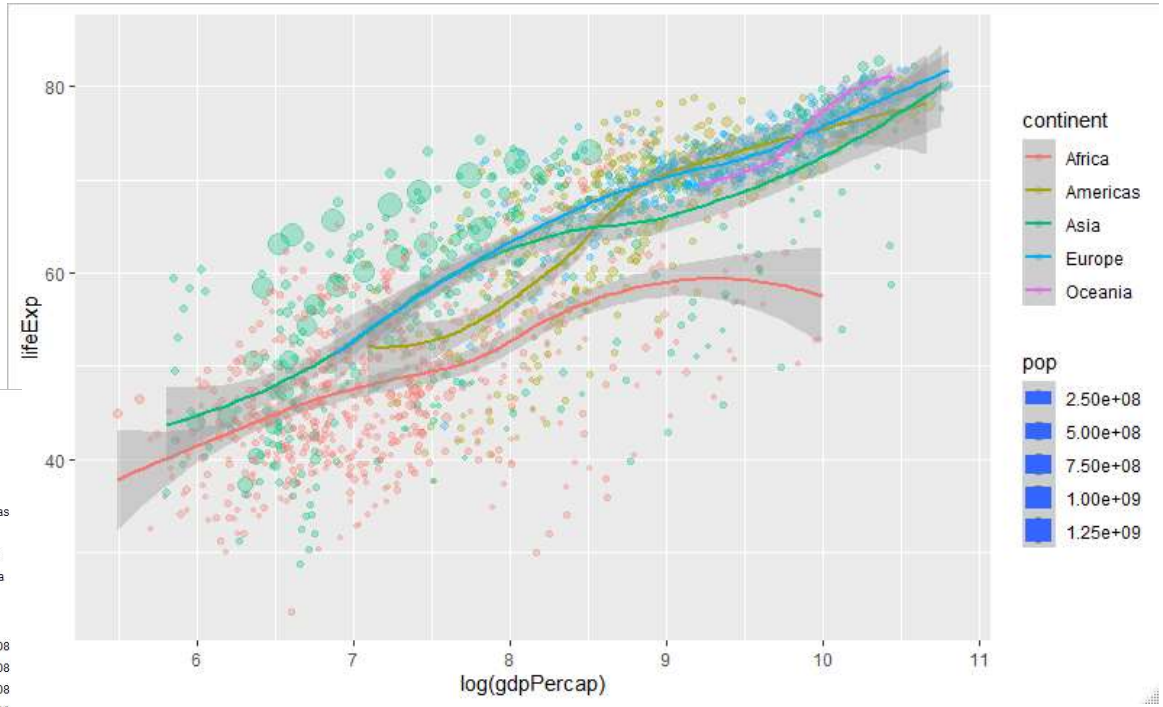

常見數據資料庫

UCI Machine Learning Repository

https://archive.ics.uci.edu/ml/index.php

Forest Fires Data Set

Download: Data Folder, Data Set Description

Abstract: This is a difficult regression task, where the aim is to predict the burned area of forest fires, in the northeast region of Portugal, by using meteorological and other data (see details at: [Web Link]).

Data Set Characteristics:	Multivariate	**Number of Instances:**	517	**Area:**	Physical
Attribute Characteristics:	Real	**Number of Attributes:**	13	**Date Donated**	2008-02-29
Associated Tasks:	Regression	**Missing Values?**	N/A	**Number of Web Hits:**	916095

常見數據資料庫

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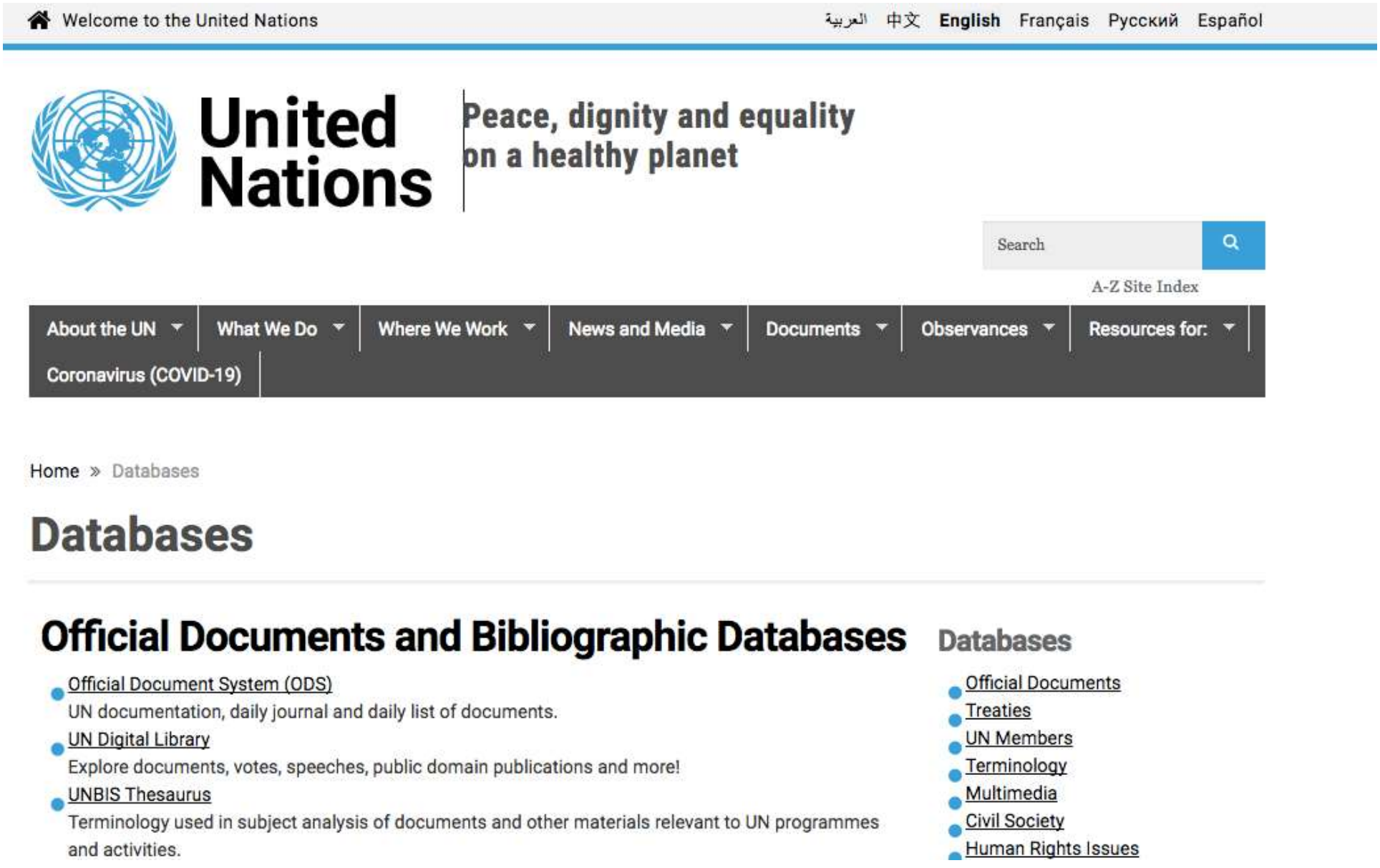
Associated Tasks:	Regression	**Missing Values?**	N/A	**Number of Web Hits:**	916095

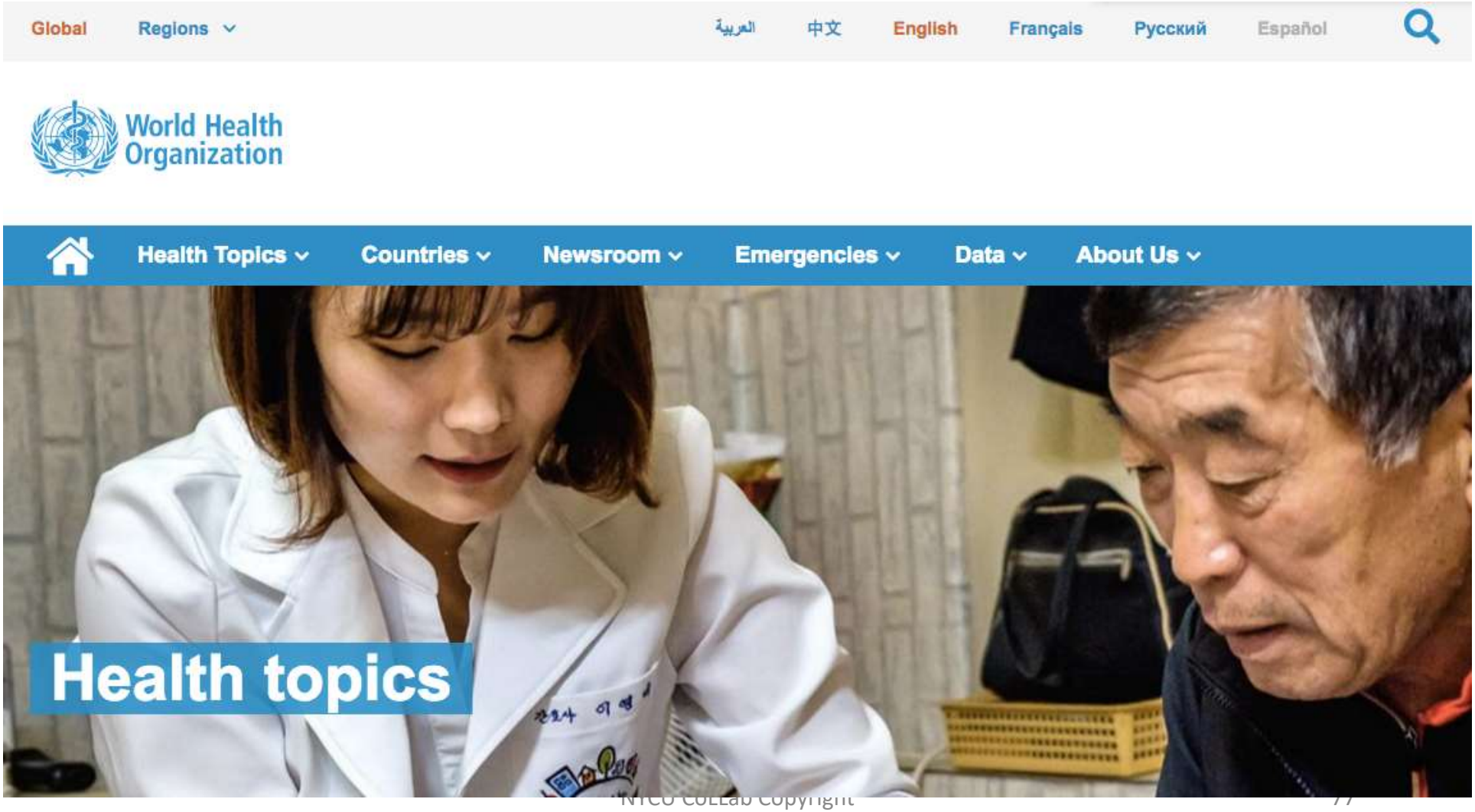
常見數據資料庫

https://www.un.org/en/databases/index.html



常見數據資料庫

https://www.who.int/health-topics/



常見數據資料庫

https://data.gov.tw/

課堂練習1: 上傳myfirst.R螢幕執行結果

透過Rstudio撰寫myfirst.R程式，
執行程式後將螢幕執行結果畫面截圖後，
儲存檔案名稱為
學號-姓名-quickstart-1.jpg

課堂練習1: 上傳myfirst.R螢幕執行結果

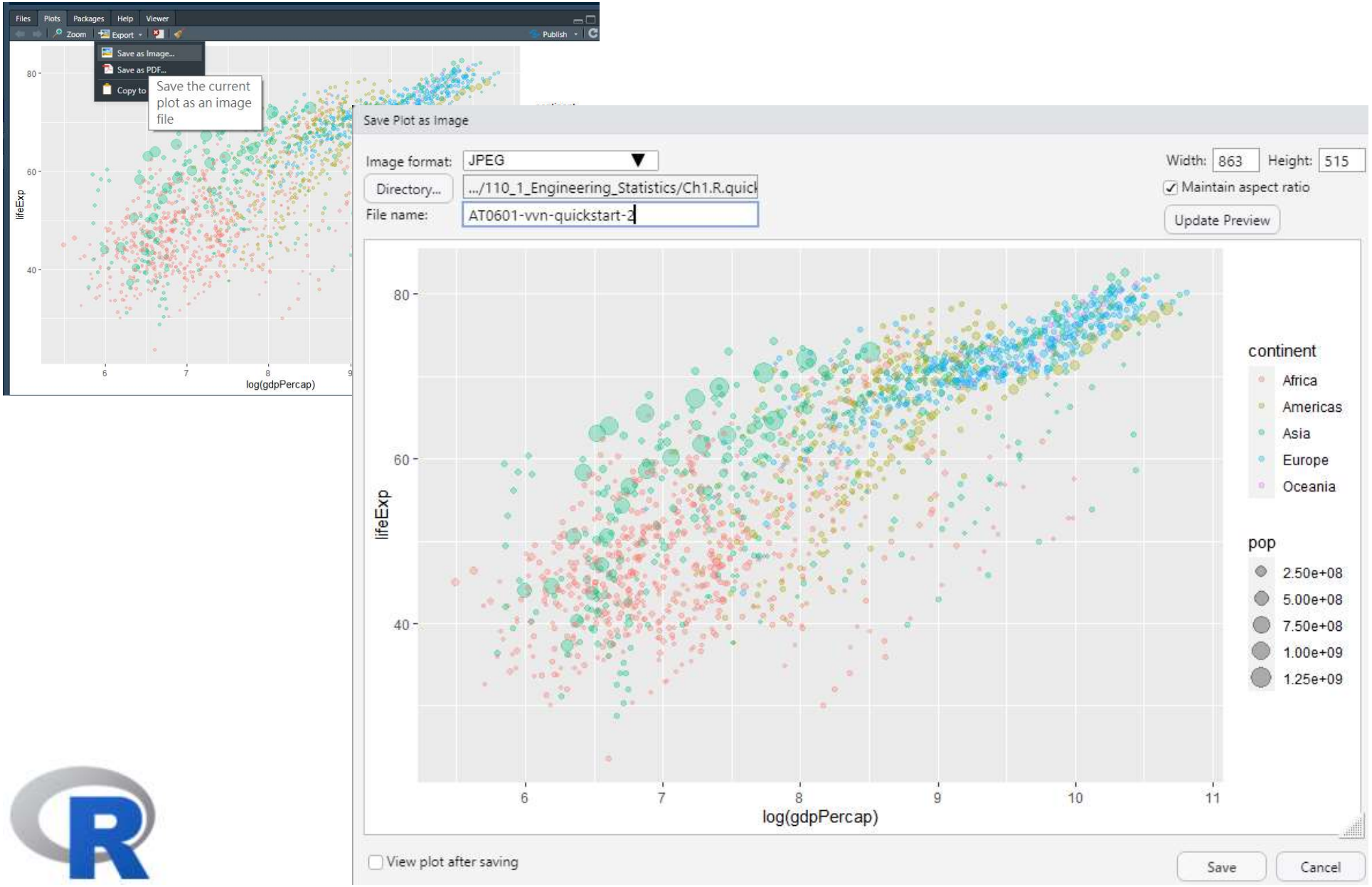
```
> # create 100 random repeatable number
> x <- sample(x = 1:100, size = 100, replace = TRUE)
> x
  [1]  89  80  22  26  40  48  14   6  54  72  85  24  67
 [14]  37  14  27  77  83   3  29  61  69  89  95  78  59
 [27] 100  84  31  77   3  40  24  93  10  77  62  42  70
 [40]  74  19  82  55  85  46  23  90  79  93  42  29  69
 [53]  86  65  86  13  22  58  70  41  97  24  22  33  74
 [66]  83   8  12  75  16  43  21   6  88  90  72  21   7
 [79]  99  42  33  94   5   5   4  11   2  10  34   2  76
 [92]   6  58  73  83   5  81  73  54  54
> # compute mean, variance, standard deviation
> mean(x)
[1] 49.84
> var(x)
[1] 962.0347
> sd(x)
[1] 31.01668
> # replace 20 number by not a number (NAN)
> y <- x
> y[sample(x = 1:100, size = 20, replace = FALSE)] <- NaN
```

```
> y
  [1]  89 NaN  22  26 NaN  48 NaN NaN  54  72  85 NaN NaN
 [14]  37  14  27  77  83   3  29  61  69  89  95  78  59
 [27] 100  84  31  77   3  40  24  93 NaN  77  62  42 NaN
 [40]  74  19  82  55 NaN  46  23  90 NaN  93  42  29 NaN
 [53]  86  65 NaN  13  22 NaN  70  41  97 NaN  22  33  74
 [66]  83   8  12  75  16 NaN  21 NaN  88  90  72  21   7
 [79]  99  42  33  94   5   5   4  11   2  10 NaN NaN  76
 [92]   6 NaN  73 NaN   5  81  73  54  54
> mean(y)
[1] NaN
> mean(y,na.rm = TRUE)
[1] 50.575
>
```

課堂練習2: 上傳dplyr_demo.R 繪圖成果

執行程式dplyr_demo.R後將繪圖成果，
儲存檔案名稱為
學號-姓名-quickstart-2.jpg

課堂練習2: 上傳dplyr_demo.R 繪圖成果



Exercise (課堂/課後練習) 60%

- 課堂當天晚上11:55分以前繳交
- 評分準則

(1)繳交時間

(2)完成度

(程式碼+圖檔美感+文字說明)