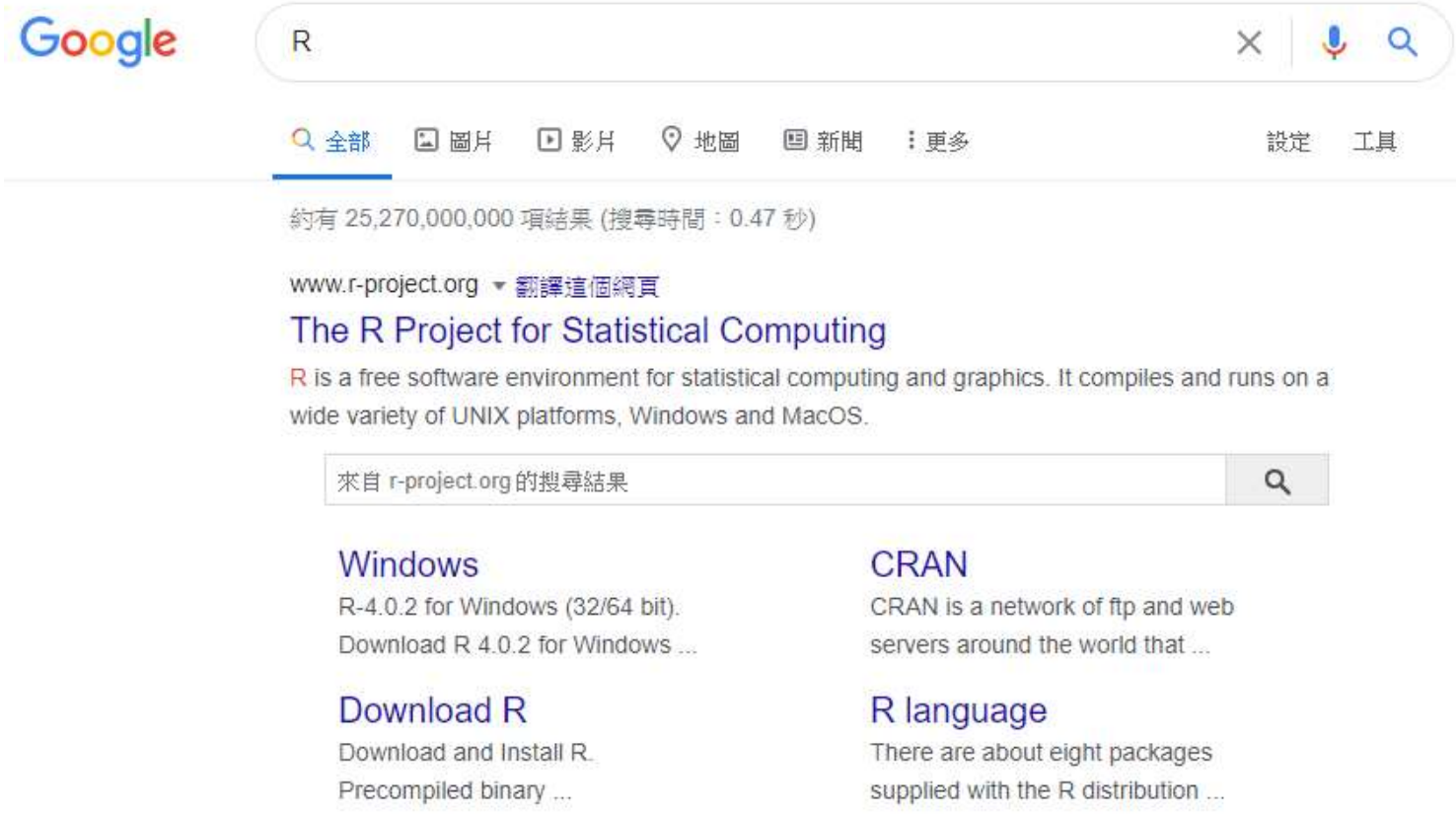
R語言
Keras及XGBoost套件CPU版本
安裝教學

中山大學財管系王昭文老師團隊
指導老師：中山大學財管系 王昭文 教授
簡報製作：中山大學財管系 蘇彥庭 研究助理
2020/09/15

索引

- 安裝R及RStudio
- 安裝Anaconda (安裝Keras才需要 若只需要XGBoost不需要安裝)
- 安裝Keras CPU版本
- 安裝XGBoost CPU版本

安裝R及RStudio



頁面直接連結：https://www.r-project.org/

[Home]

Download

CRAN

R Project

About R
Logo
Contributors
What's New?
Reporting Bugs
Conferences
Search
Get Involved: Mailing Lists
Developer Pages
R Blog

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 4.0.2 (Taking Off Again)** has been released on 2020-06-22.
- useR! 2020 in Saint Louis has been cancelled. The European hub planned in Munich will not be an in-person conference. Both organizing committees are working on the best course of action.
- **R version 3.6.3 (Holding the Windsock)** has been released on 2020-02-29.
- You can support the R Foundation with a renewable subscription as a supporting member

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.

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
Austria	
https://cran.wu.ac.at/	Wirtschaftsuniversität Wien

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

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 (2020-06-22, Taking Off Again) R-4.0.2.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.

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.

點選後即會下載R安裝檔案

R-4.0.2 for Windows (32/64 bit)

Download R 4.0.2 for Windows (84 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 c
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?

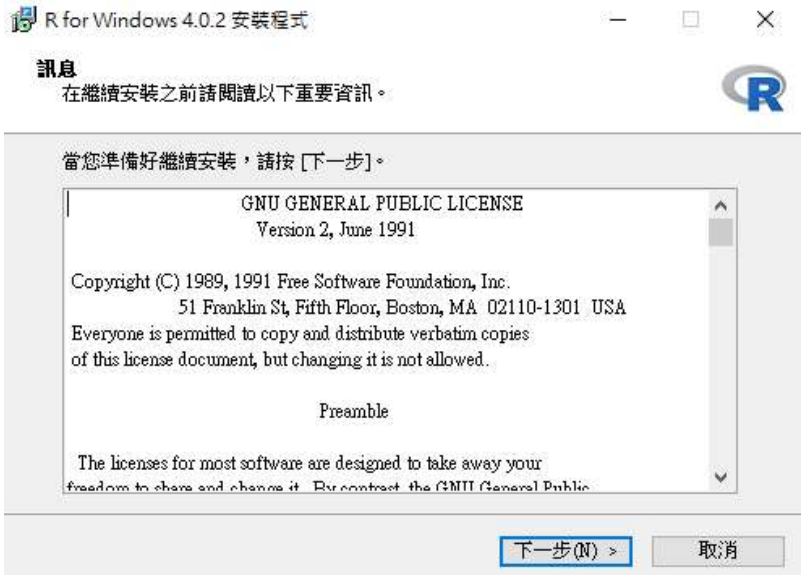
Please see the R FAQ for general information about R and the R Windows FAQ for Windows-specific information.

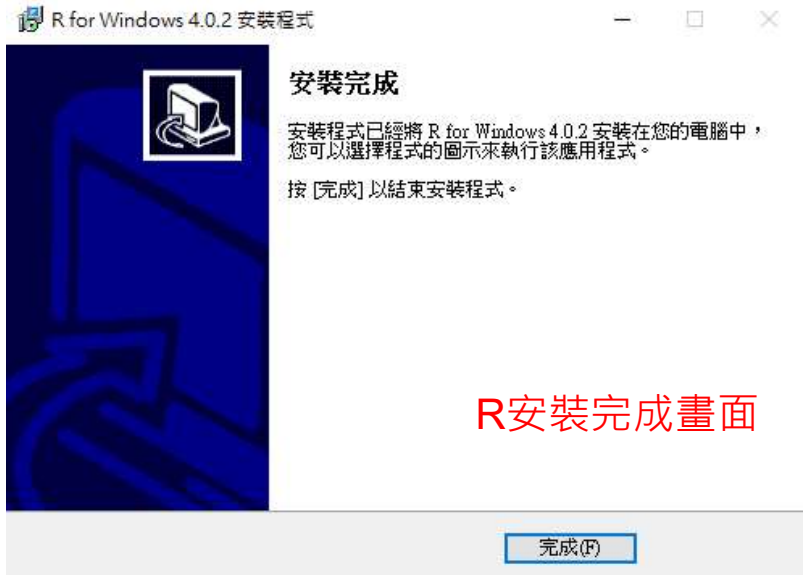
Other builds

- 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

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

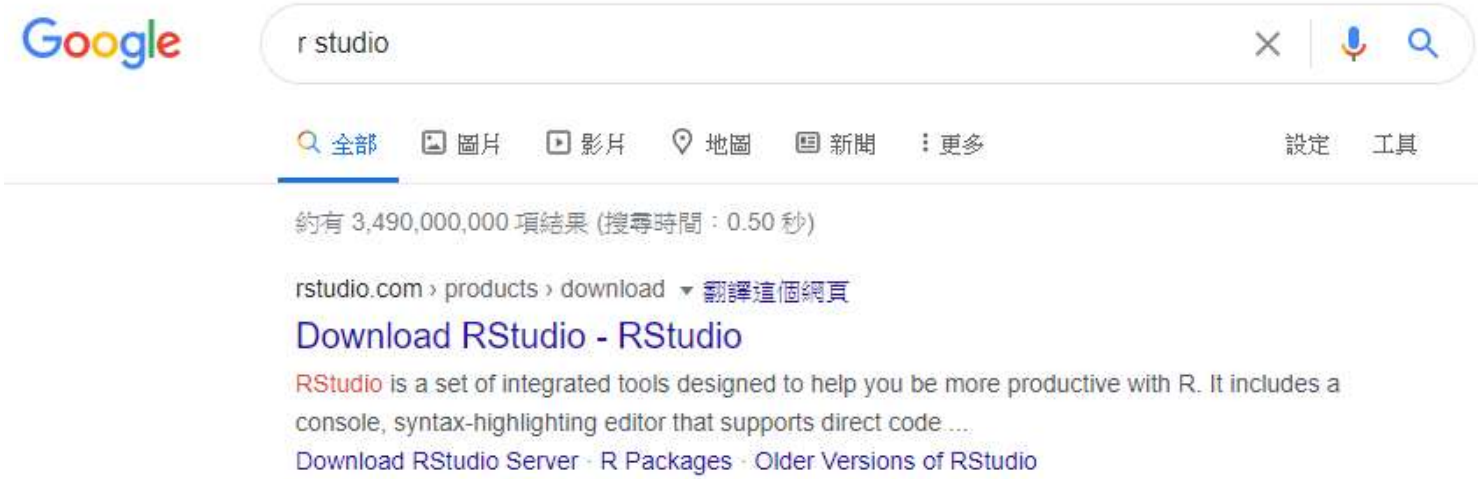
Last change: 2020-06-22





R安裝完成畫面

安裝過程一直按下一步即可
請不要隨便修改安裝路徑(例如由C:/改到D:/)



頁面直接連結： https://rstudio.com/

RStudio

DOWNLOAD SUPPORT DOCS COMMUNITY

Products Solutions Customers Resources About Pricing

Download RStudio

Choose Your Version

RStudio Team

--首頁往下拉--

RStudio Desktop 1.3.1056 - Release Notes

1. Install R. RStudio requires R 3.0.1+.

2. Download RStudio Desktop. Recommended for your system:

DOWNLOAD RSTUDIO FOR WINDOWS
1.3.1056 | 171.62MB

Requires Windows 10/8/7 (64-bit)

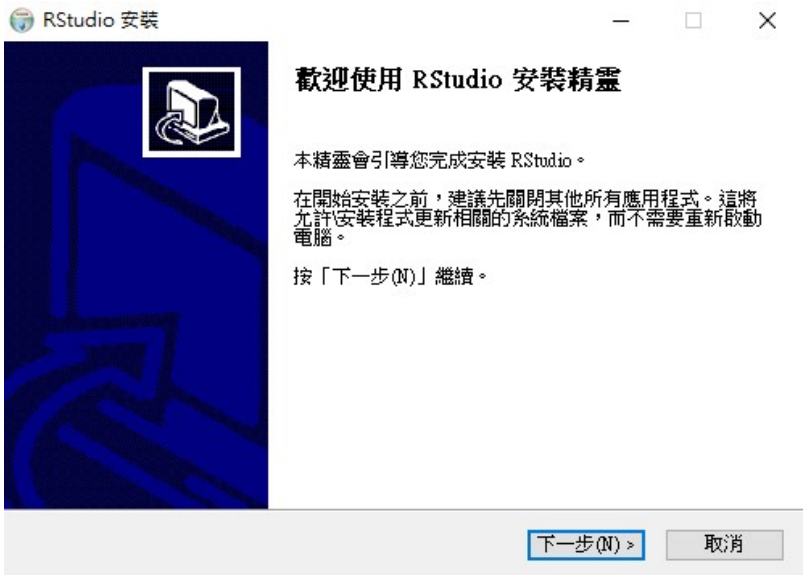
All Installers

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.

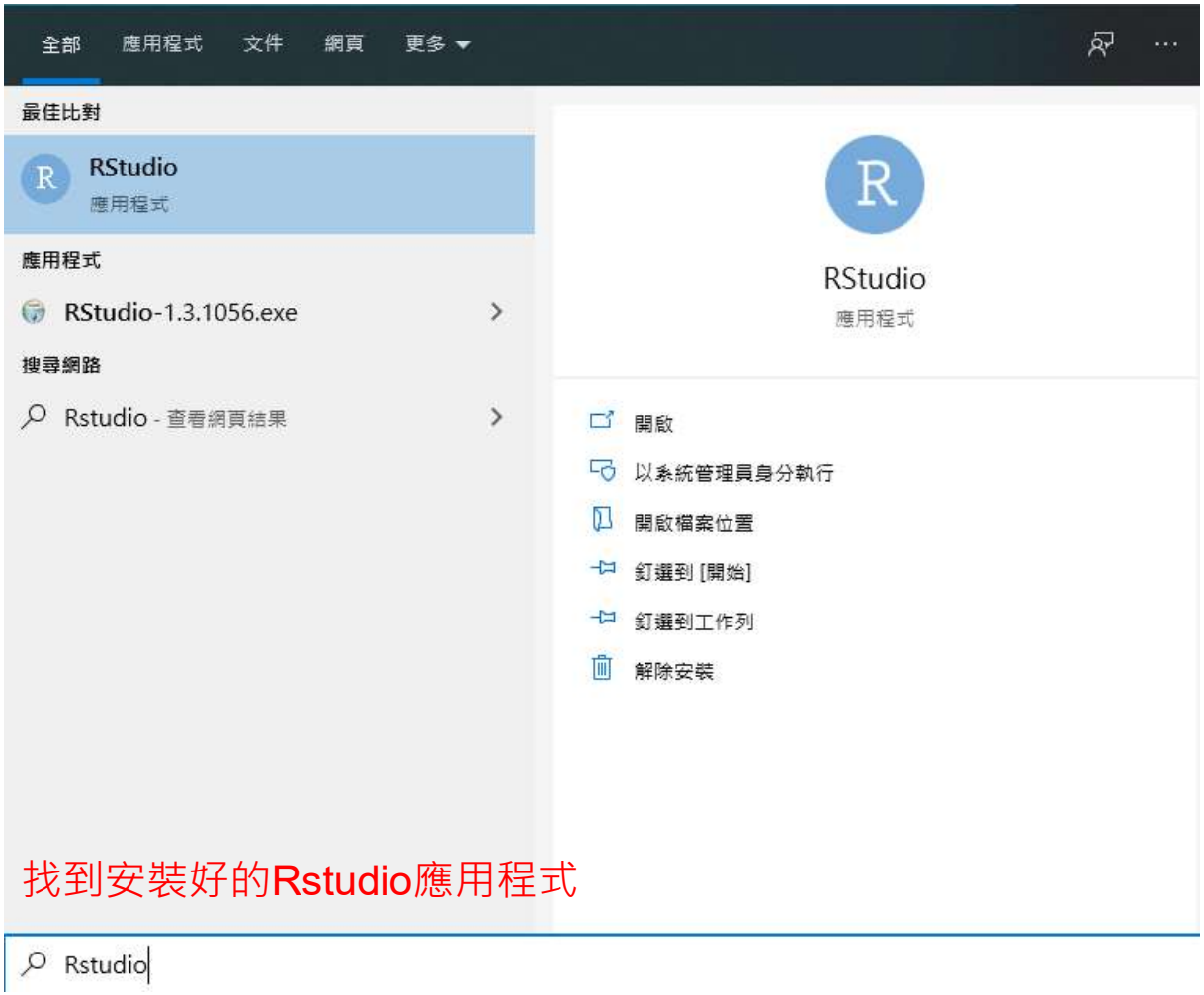
點選後即會下載RStudio安裝檔案

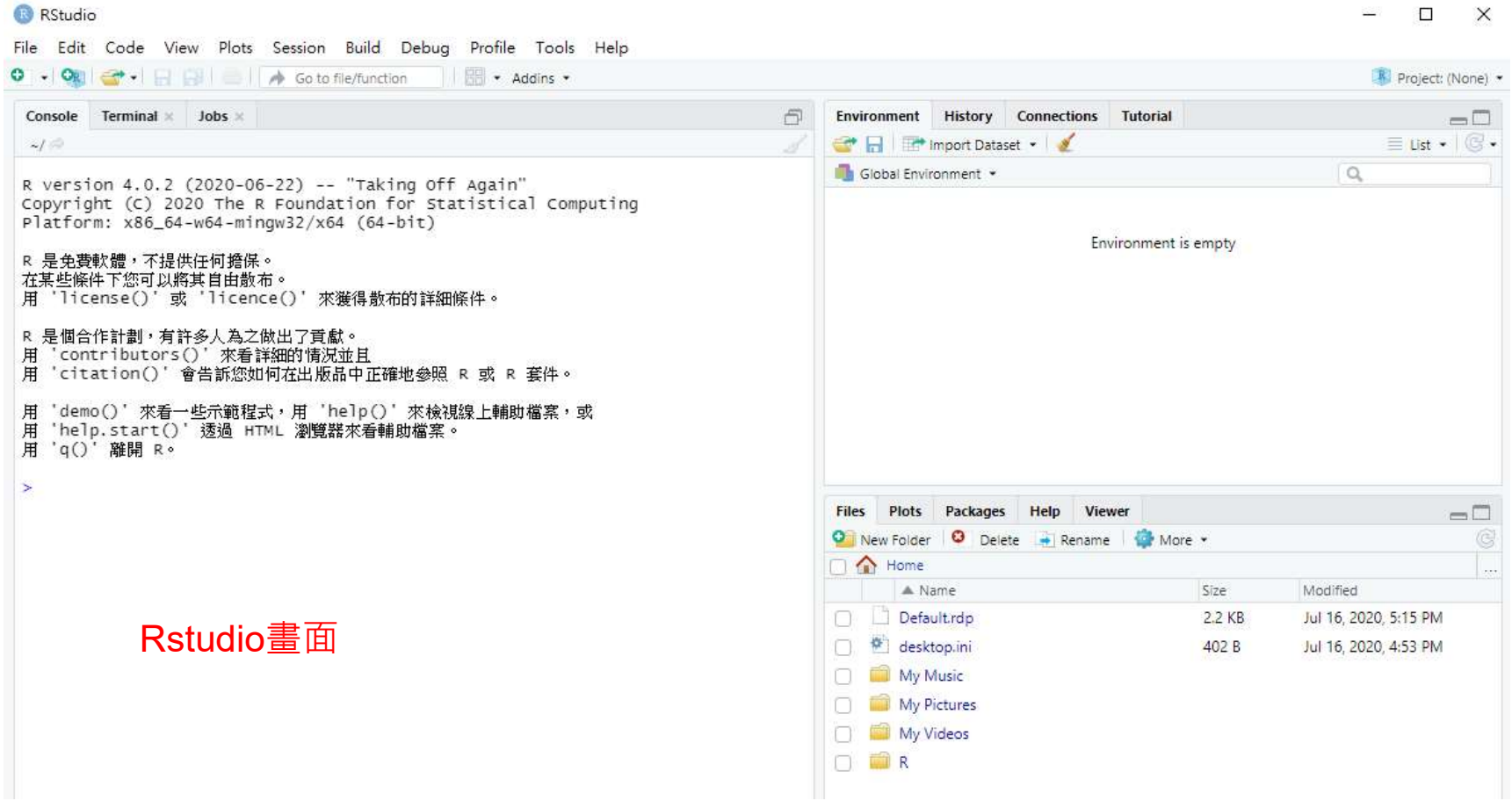
OS	Download	Size	SHA-256
Windows 10/8/7	RStudio-1.3.1056.exe	171.62 MB	a8f1fee5
macOS 10.13+	RStudio-1.3.1056.dmg	148.64 MB	f343c77d
Ubuntu 16	rstudio-1.3.1056-amd64.deb	124.56 MB	cbd5e5e5



R安裝完成畫面

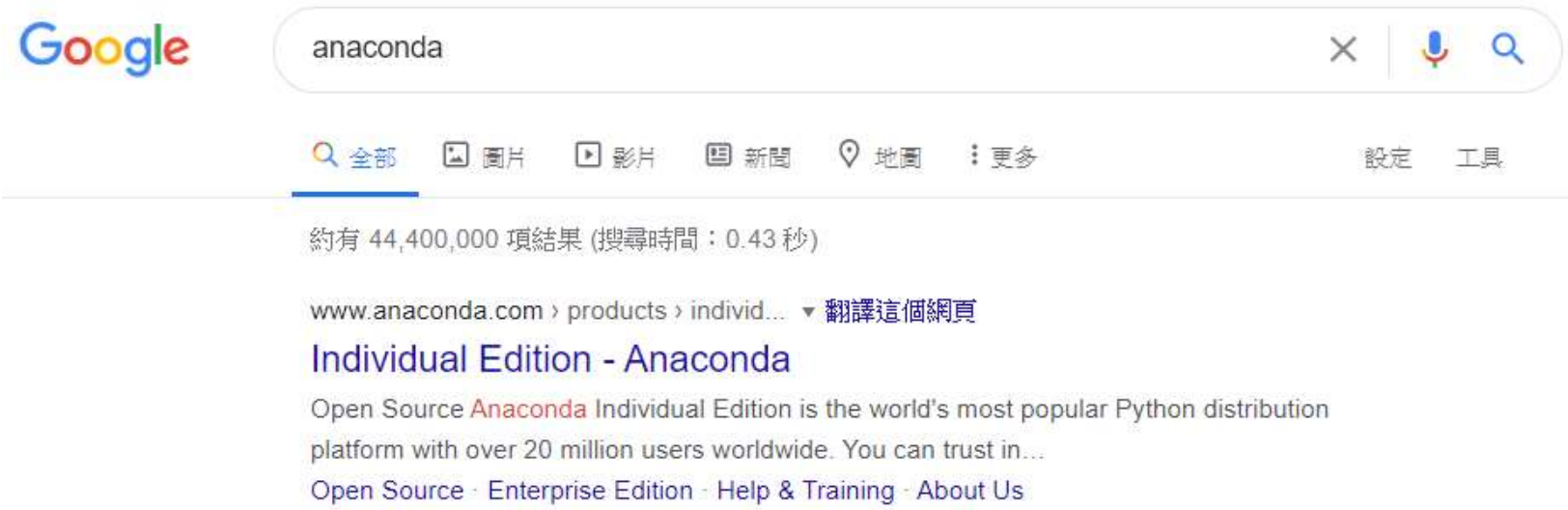
安裝過程一直按下一步即可
請不要隨便修改安裝路徑(例如由C:/改到D:/)


全部
應用程式
文件
網頁
更多
最佳比對
RStudio
應用程式
應用程式
RStudio-1.3.1056.exe
搜尋網路
Rstudio - 查看網頁結果
RStudio
應用程式
開啟
以系統管理員身分執行
開啟檔案位置
釘選到 [開始]
釘選到工作列
解除安裝
找到安裝好的Rstudio應用程式
Rstudio

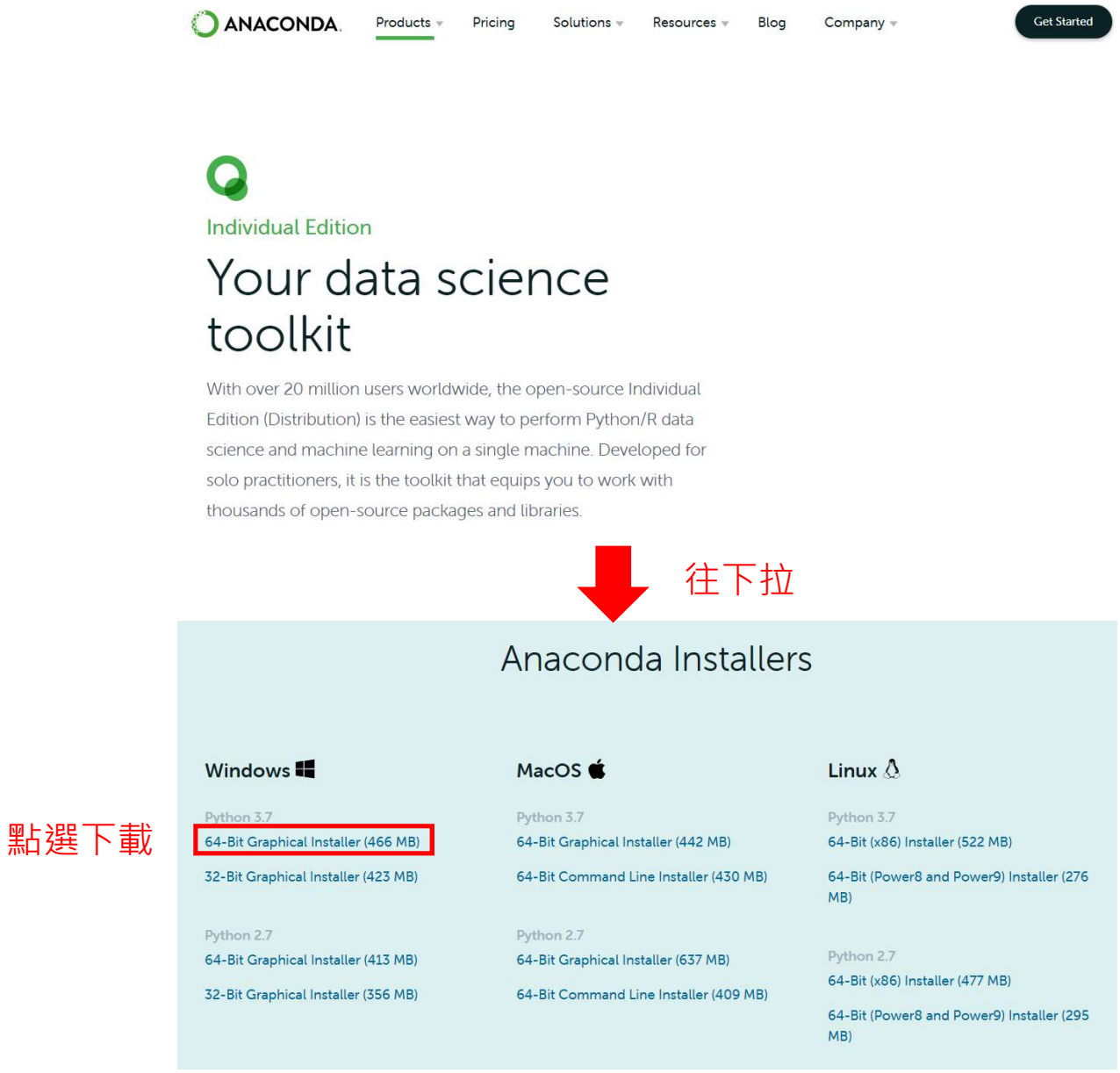

RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Console
Terminal
Jobs
~/
R version 4.0.2 (2020-06-22) -- "Taking Off Again"
Copyright (C) 2020 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)
R 是免費軟體，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。
>
Environment
History
Connections
Tutorial
Import Dataset
List
Global Environment
Environment is empty
Files
Plots
Packages
Help
Viewer
New Folder
Delete
Rename
More
Home
Name
Size
Modified
Default.rdp
2.2 KB
Jul 16, 2020, 5:15 PM
desktop.ini
402 B
Jul 16, 2020, 4:53 PM
My Music
My Pictures
My Videos
R

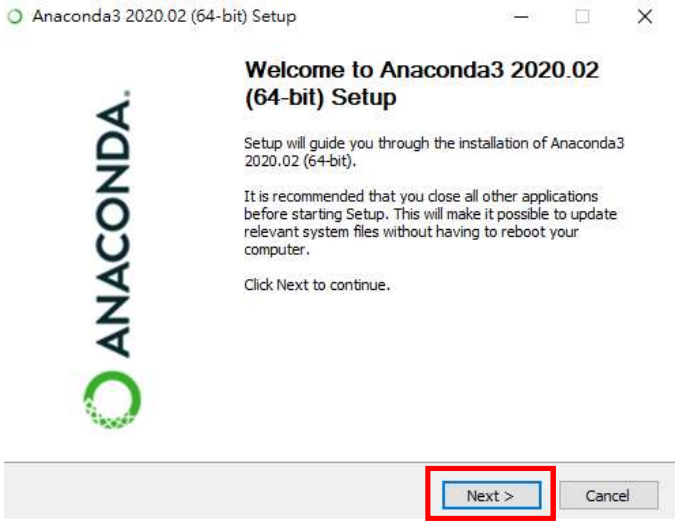
Rstudio畫面

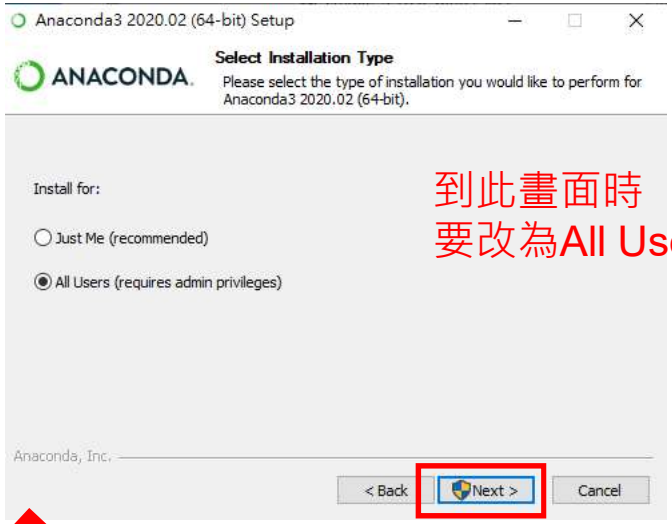
安裝Anaconda



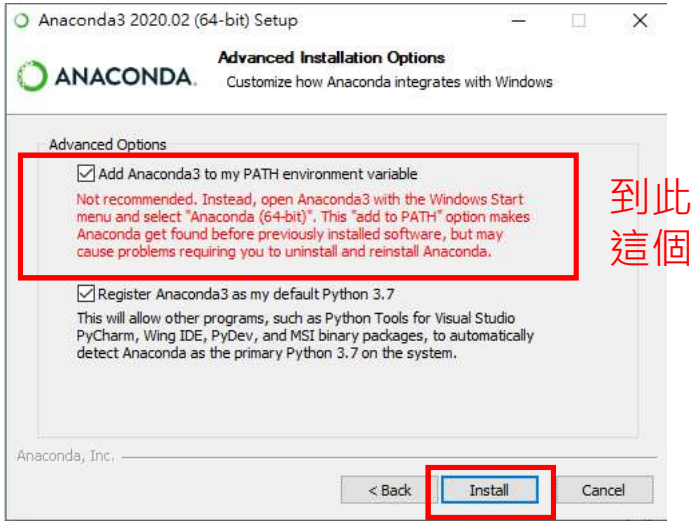
頁面直接連結： https://www.anaconda.com/products/individual


ANACONDA.
Products
Pricing
Solutions
Resources
Blog
Company
Get Started
Individual Edition
Your data science toolkit
With over 20 million users worldwide, the open-source Individual Edition (Distribution) is the easiest way to perform Python/R data science and machine learning on a single machine. Developed for solo practitioners, it is the toolkit that equips you to work with thousands of open-source packages and libraries.
往下拉
Anaconda Installers
Windows
Python 3.7
64-Bit Graphical Installer (466 MB)
32-Bit Graphical Installer (423 MB)
Python 2.7
64-Bit Graphical Installer (413 MB)
32-Bit Graphical Installer (356 MB)
MacOS
Python 3.7
64-Bit Graphical Installer (442 MB)
64-Bit Command Line Installer (430 MB)
Python 2.7
64-Bit Graphical Installer (637 MB)
64-Bit Command Line Installer (409 MB)
Linux
Python 3.7
64-Bit (x86) Installer (522 MB)
64-Bit (Power8 and Power9) Installer (276 MB)
Python 2.7
64-Bit (x86) Installer (477 MB)
64-Bit (Power8 and Power9) Installer (295 MB)
點選下載





到此畫面時
要改為All Users選項



到此畫面時
這個一定要打勾!!!

安裝結束畫面

安裝Keras CPU版本

依據官網指引，TensorFlow2.1.0版本開始需要額外安裝*適用於 Visual Studio 2015、2017 和 2019 的 Microsoft Visual C ++ 可轉散發套件*

下載連結：https://support.microsoft.com/en-us/help/2977003/the-latest-supported-visual-c-downloads

點選

The latest supported Visual C++ downloads

Applies to: Visual Studio 2010, Visual Studio 2012, Visual Studio 2013, More

Notice

Some of the downloads that are mentioned in this article are currently available on My.VisualStudio.com. Make sure to log in by using a Visual Studio Subscription account so that you can access the download links.

If you are asked for credentials, use your existing Visual Studio subscription account or create a free account by selecting "Create a new Microsoft account."

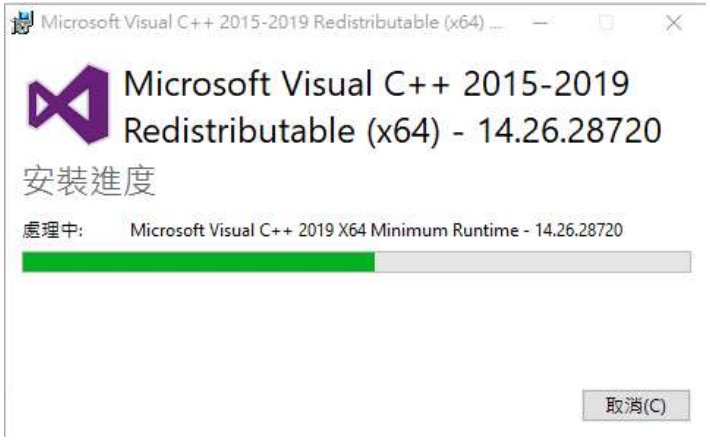
Summary

This article lists the download links for the latest versions of Microsoft Visual C++.

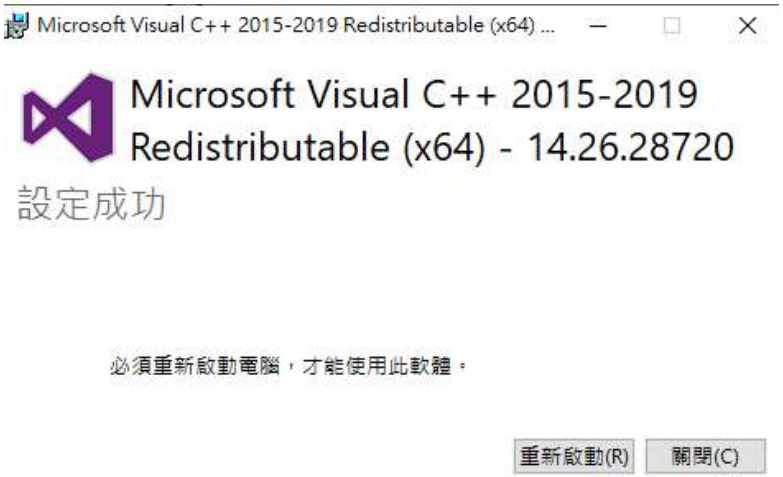
Visual Studio 2015, 2017 and 2019

Download the Microsoft Visual C++ Redistributable for Visual Studio 2015, 2017 and 2019. The following updates are the latest supported Visual C++ redistributable packages for Visual Studio 2015, 2017 and 2019. Included is a baseline version of the Universal C Runtime see MSDN for details.

- x86: vc_redist.x86.exe
- x64: vc_redist.x64.exe 點選下載
- ARM64: vc_redist.arm64.exe

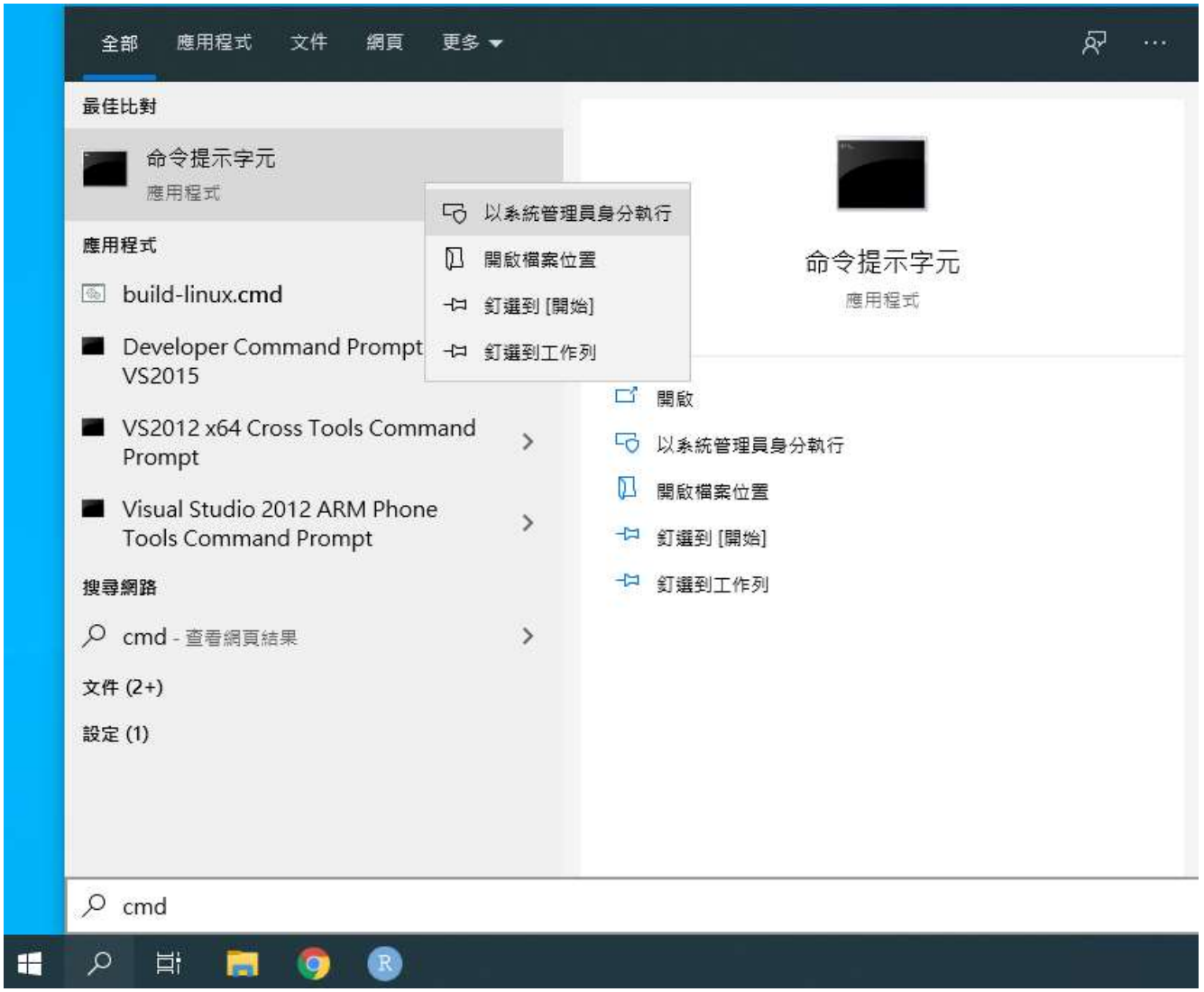


安裝過程一直按下一步即可



手動安裝虛擬環境(Conda)

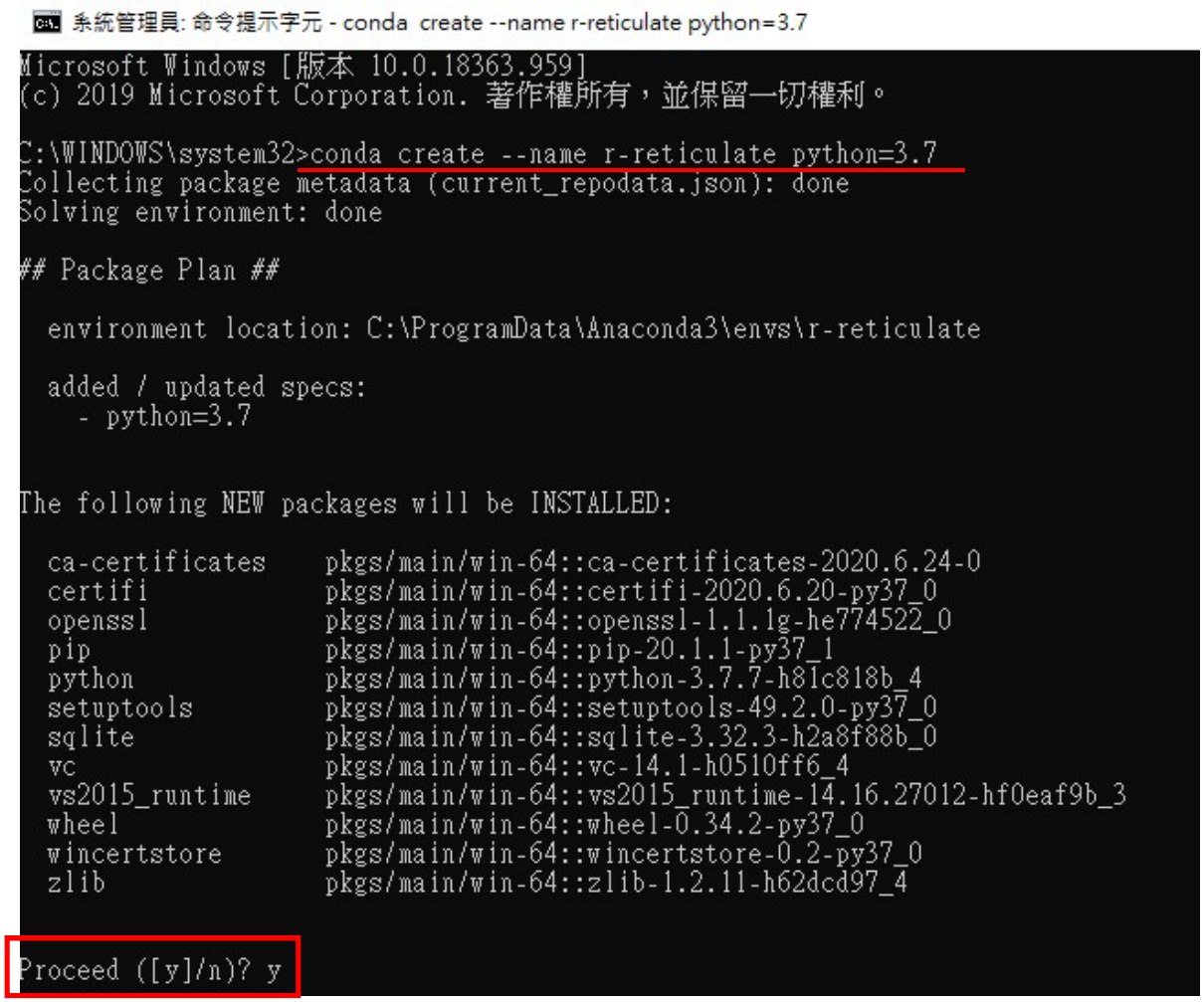
以系統管理員身分打開命令提示字元



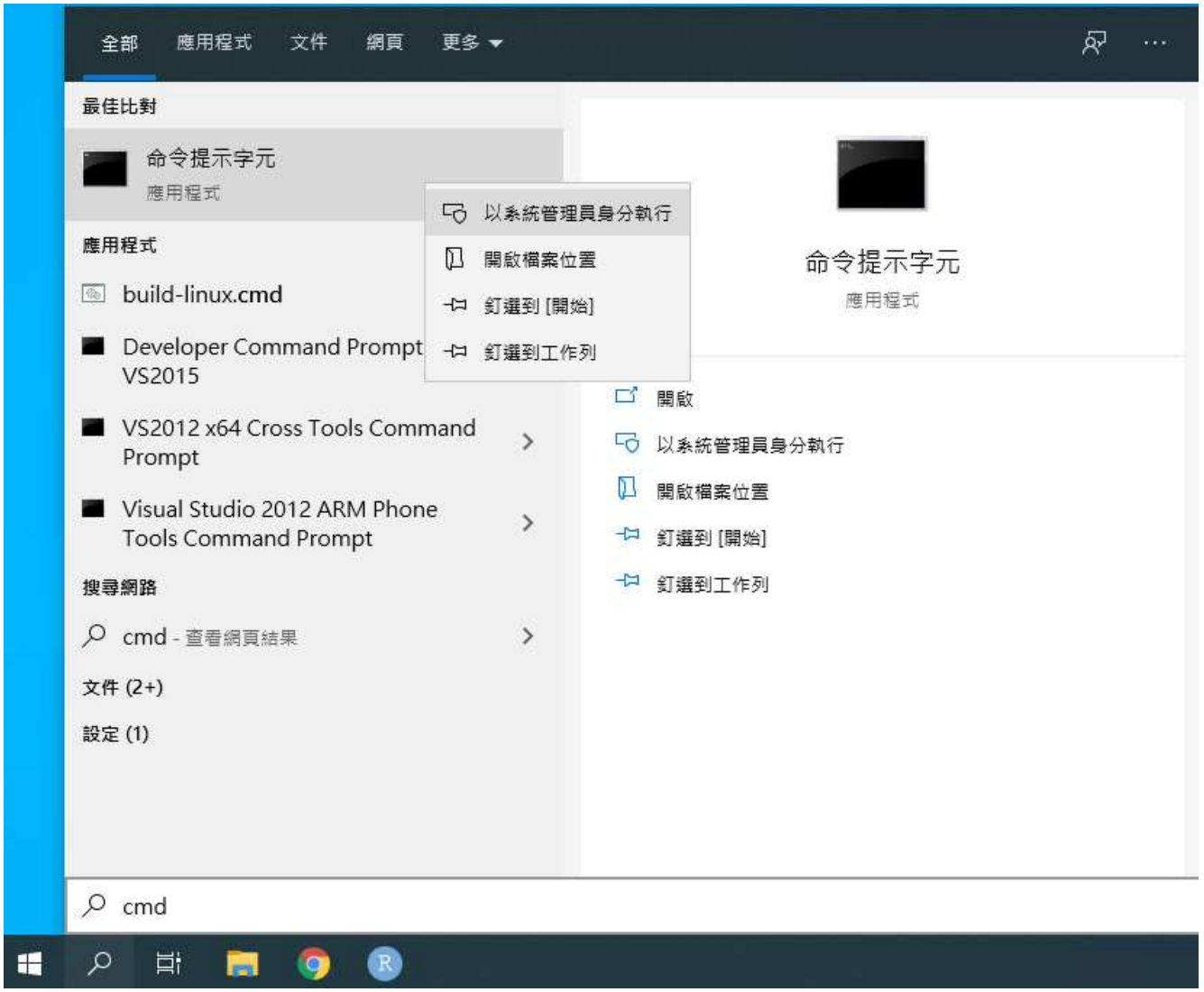
輸入指令

建立Conda環境，安裝Python3.7版，環境命名為r-reticulate

conda create --name r-reticulate python=3.7



建立好虛擬環境後，
重新開啟命令提示字元，
記得要以系統管理員身分執行



依序輸入指令

1.進入r-reticulate虛擬環境

conda activate r-reticulate

2. 升級pip套件

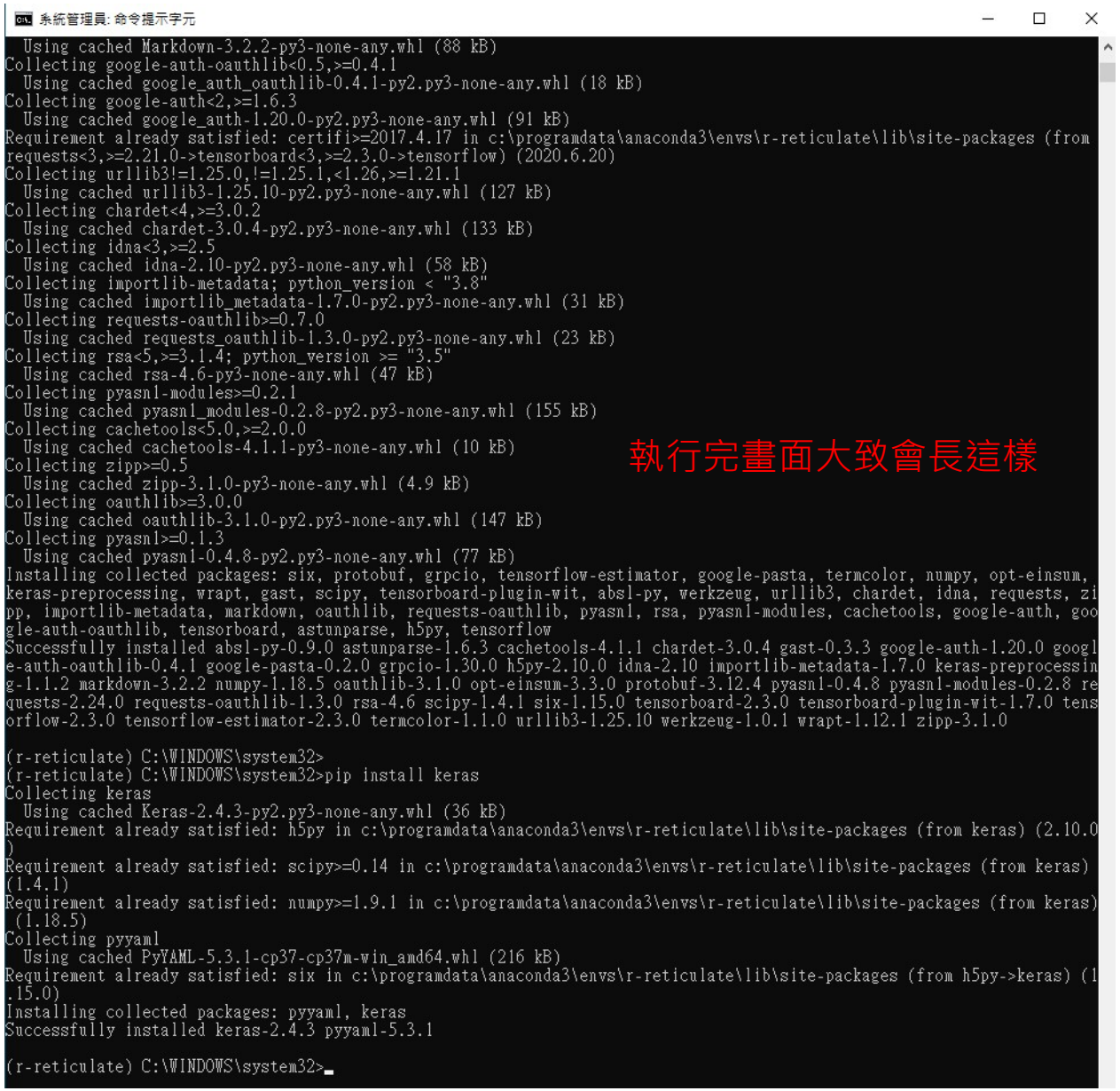
pip install --upgrade pip

3. 安裝tensorflow套件

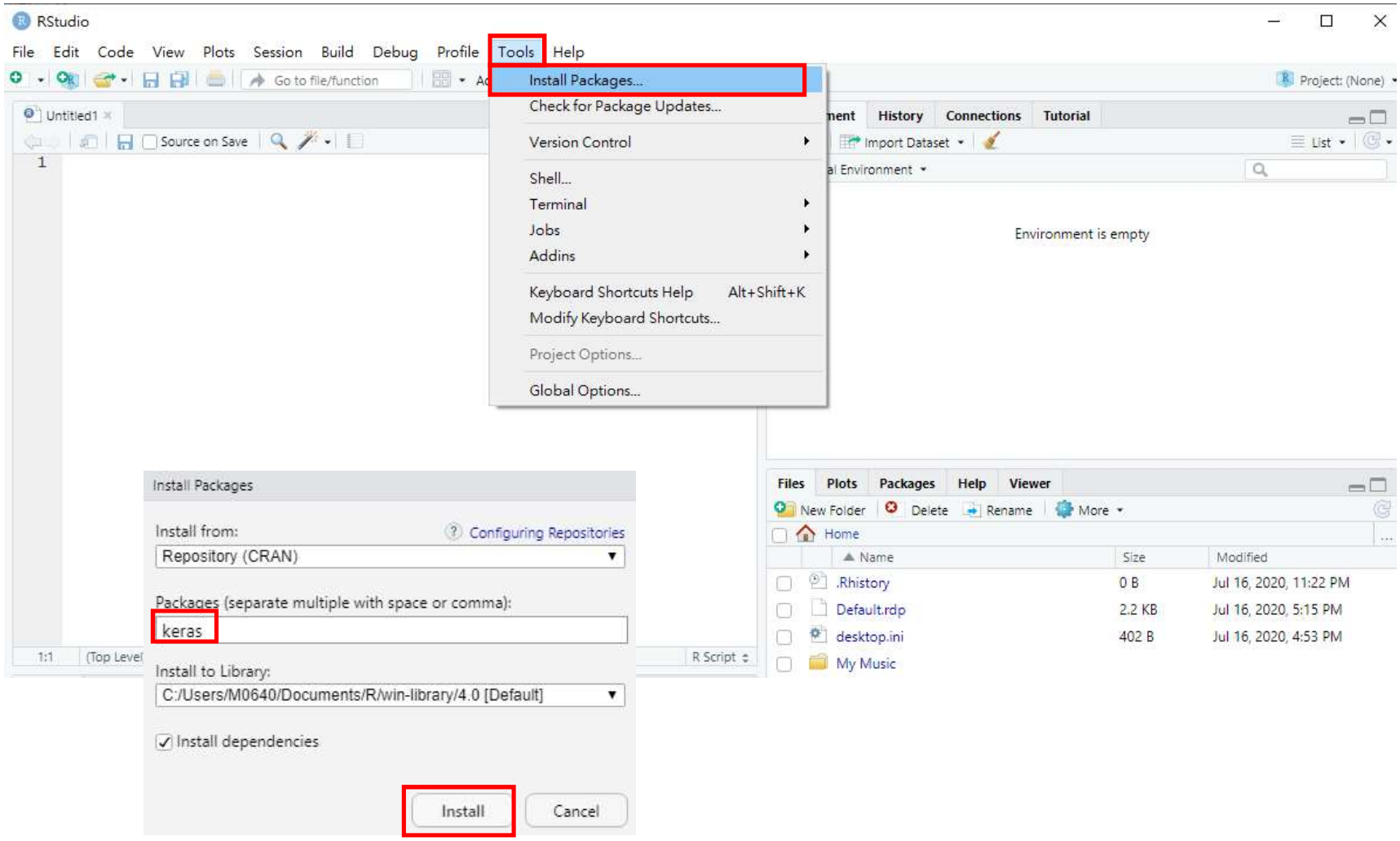
pip install tensorflow==2.2

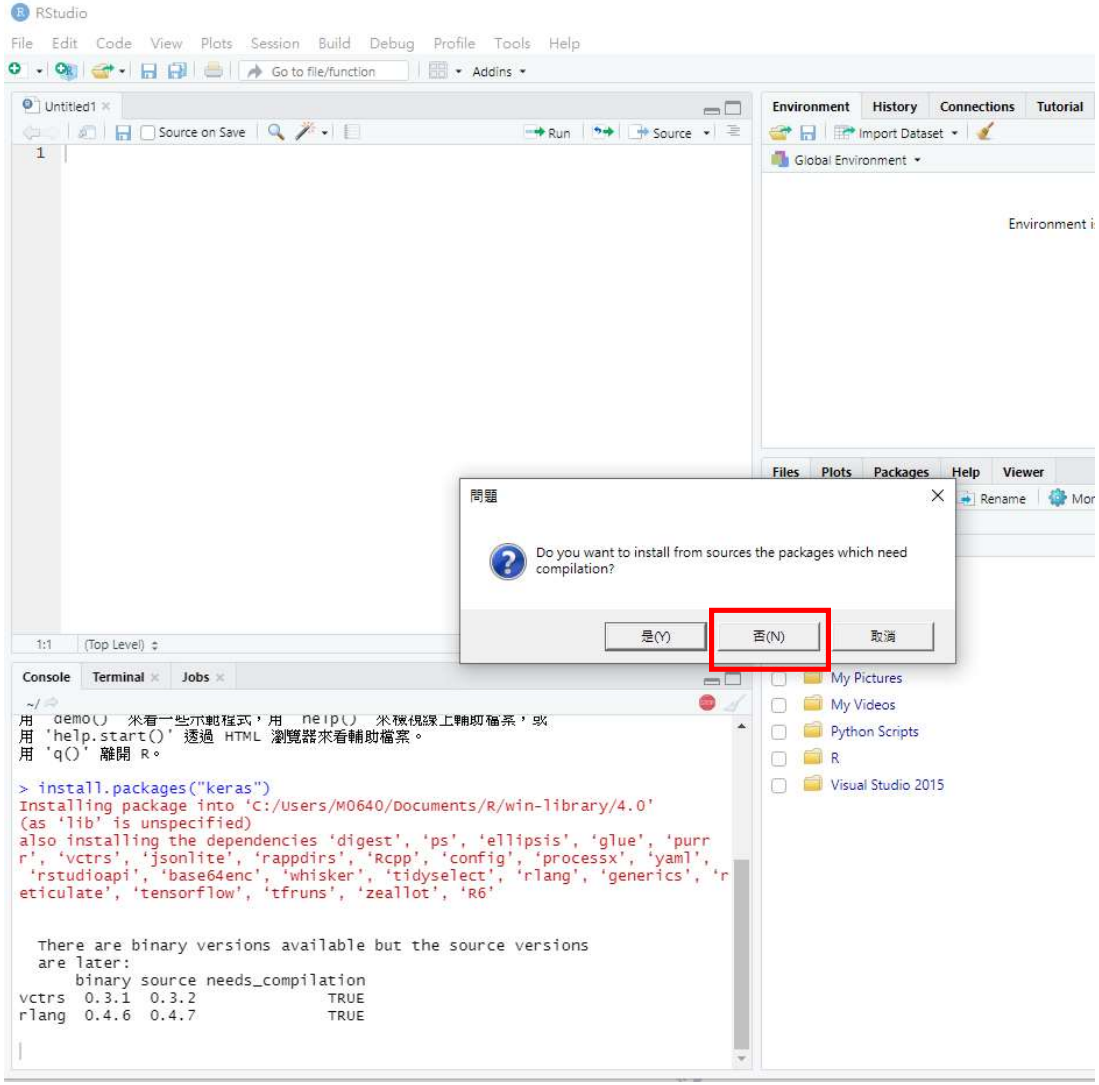
4. 安裝keras套件

pip install keras



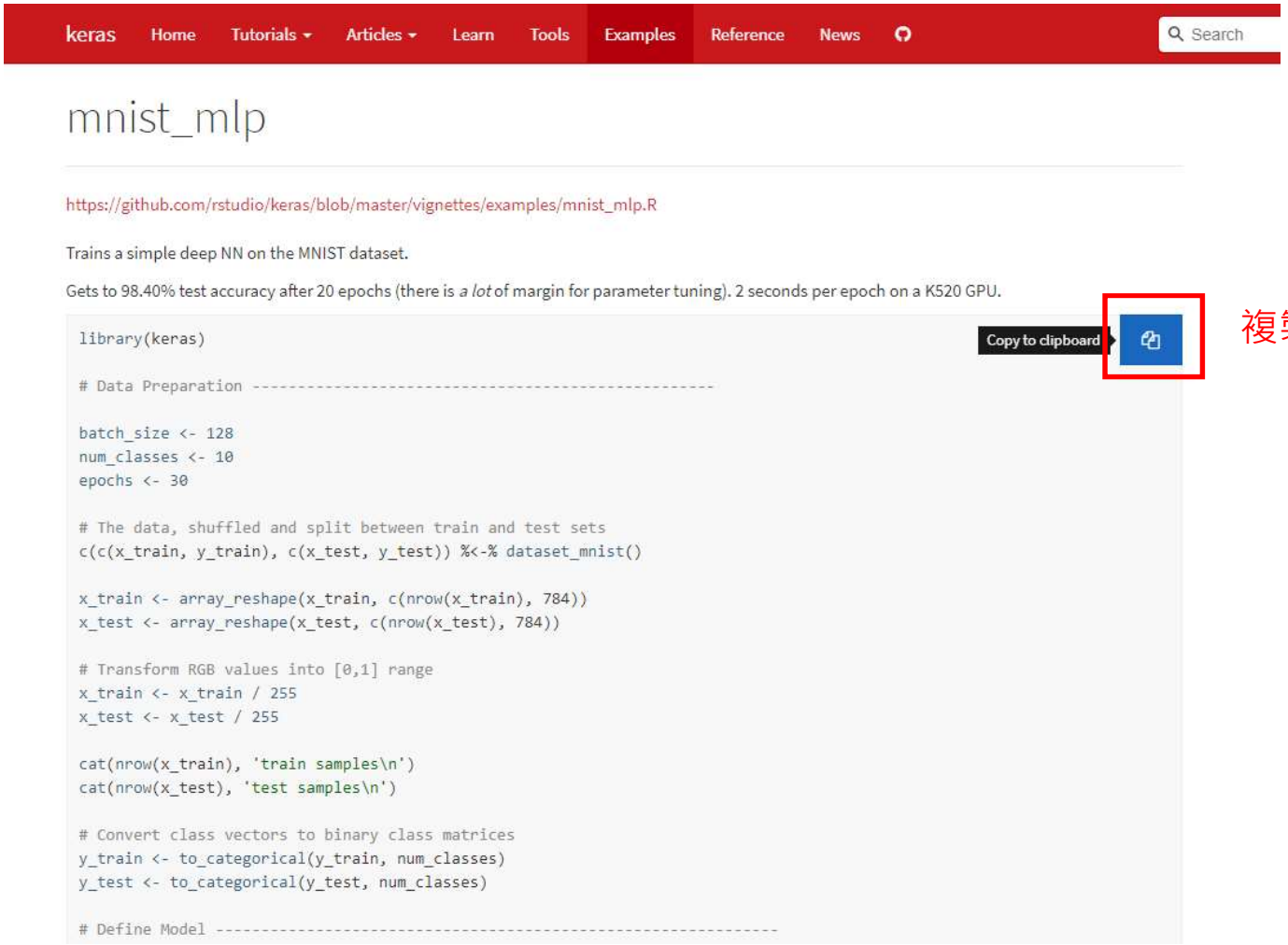
接著開啟R安裝Keras套件




RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Untitled1
Source on Save
Run
Source
Environment History Connections Tutorial
Import Dataset
Global Environment
Environment i
Files Plots Packages Help Viewer
Rename
Mor
問題
Do you want to install from sources the packages which need compilation?
是(Y)
否(N)
取消
Console Terminal Jobs
~/
用 'help.start()' 透過 HTML 瀏覽器來看輔助檔案。
用 'q()' 離開 R。
> install.packages("keras")
Installing package into 'C:/Users/M0640/Documents/R/win-library/4.0'
(as 'lib' is unspecified)
also installing the dependencies 'digest', 'ps', 'ellipsis', 'glue', 'purr
r', 'vctrs', 'jsonlite', 'rappdirs', 'Rcpp', 'config', 'processx', 'yaml',
'rstudioapi', 'base64enc', 'whisker', 'tidyselect', 'rlang', 'generics', 'r
eticulate', 'tensorflow', 'tfruns', 'zeallot', 'R6'
There are binary versions available but the source versions
are later:
binary source needs_compilation
vctrs 0.3.1 0.3.2 TRUE
rlang 0.4.6 0.4.7 TRUE
My Pictures
My Videos
Python Scripts
R
Visual Studio 2015

至Rkeras官網下載範例程式碼

下載連結：https://keras.rstudio.com/articles/examples/mnist_mlp.html



複製全部程式碼

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

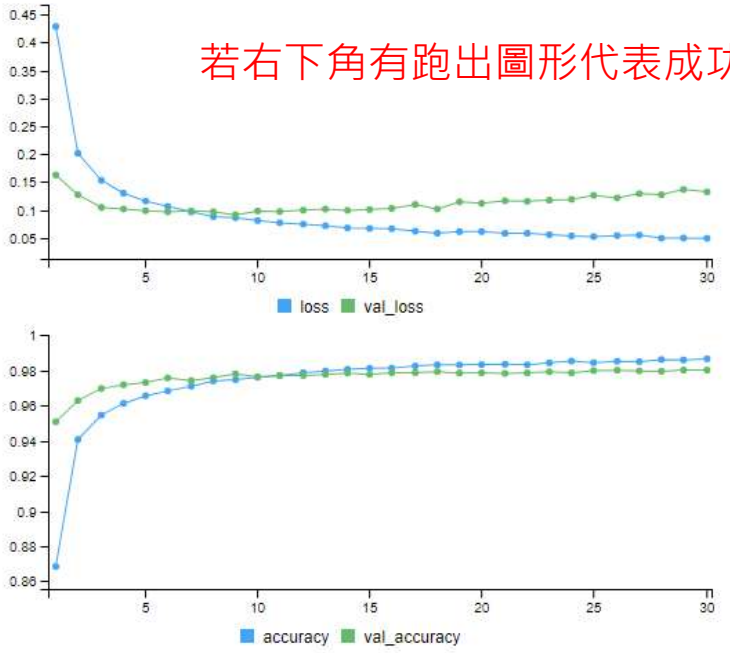
Untitled2*

```
1  library(keras)
2
3  # Data Preparation -----------------------------------------------------
4
5  batch_size <- 128
6  num_classes <- 10
7  epochs <- 30
8
9  # The data, shuffled and split between train and test sets
10 c(c(x_train, y_train), c(x_test, y_test)) %<-% dataset_mnist()
11
12 x_train <- array_reshape(x_train, c(nrow(x_train), 784))
13 x_test <- array_reshape(x_test, c(nrow(x_test), 784))
14
15 # Transform RGB values into [0,1] range
16 x_train <- x_train / 255
17 x_test <- x_test / 255
18
19 cat(nrow(x_train), 'train samples\n')
20 cat(nrow(x_test), 'test samples\n')
21
22 # Convert class vectors to binary class matrices
23 y_train <- to_categorical(y_train, num_classes)
24 y_test <- to_categorical(y_test, num_classes)
25
26 # Define Model ---------------------------------------------------------
27
28 model <- keras_model_sequential()
29 model %>%
30   layer_dense(units = 256, activation = 'relu', input_shape = c(784)
31   layer_dropout(rate = 0.4) %>%
32   layer_dense(units = 128, activation = 'relu') %>%
33   layer_dropout(rate = 0.3) %>%
34   layer_dense(units = 10, activation = 'softmax')
35
36
```

貼上全部程式碼後執行

```
> cat('Test loss:', score[[1]], '\n')
Test loss: 0.1136785
> cat('Test accuracy:', score[[2]], '\n')
Test accuracy: 0.9814
>
```

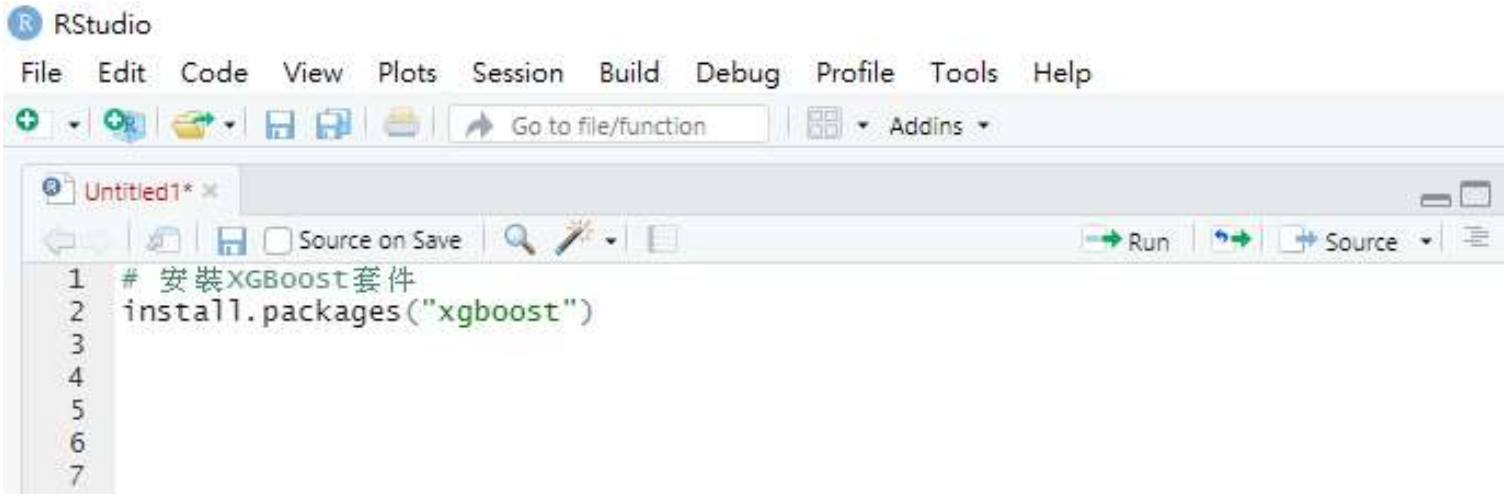
若右下角有跑出圖形代表成功順利執行



安装XGBoost CPU版本

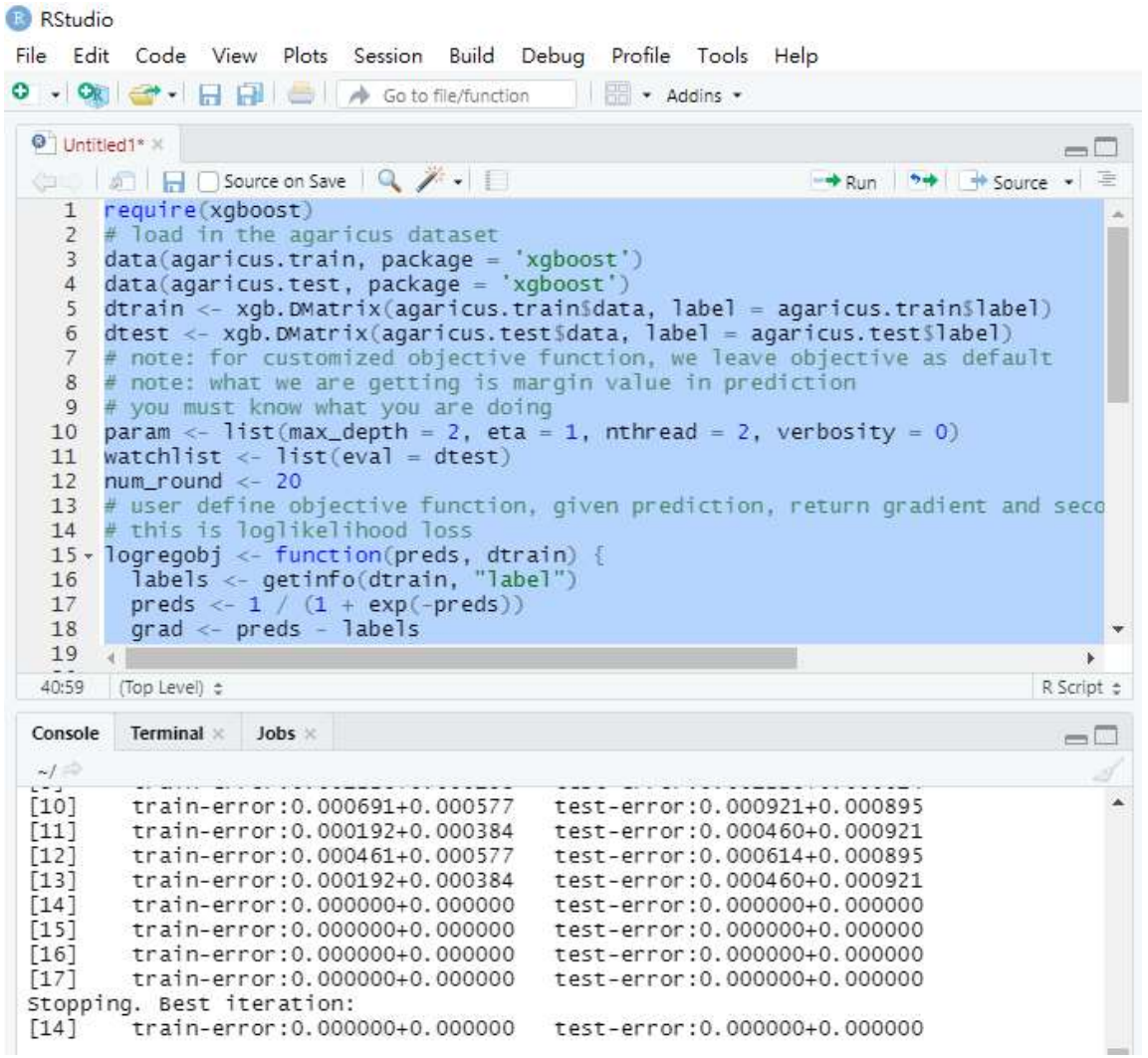
輸入程式碼安裝xgboost套件

install.packages("xgboost")



測試XGBoost CPU版本是否能夠正常運作

測試程式碼請參考：
https://github.com/dmlc/xgboost/blob/master/R-package/demo/early_stopping.R



若能順利運作代表安裝成功!

簡報結束
感謝您的閱讀