

# VirtualBox + Ubuntu + R + RStudio

- R/Python/SQL/Julia 程式設計與應用  
(R/Python/Julia/SQL/Julia Programming and Application)
- 資料視覺化 (Data Visualization)
- 機器學習 (Machine Learning)
- 統計品管 (Statistical Quality Control)
- 最佳化 (Optimization)



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# 大綱

1. VirtualBox 下載與安裝
2. Ubuntu 下載與安裝
3. Ubuntu + R 安裝
4. Ubuntu + RStudio 安裝
5. 結論

# 1. VirtualBox 下載與安裝

- 步驟1 下載並安裝 VirtualBox
- 步驟2 下載並安裝 VirtualBox Extension Pack

# 步驟1 下載並安裝 VirtualBox

- 下載: <https://www.virtualbox.org/>



Windows hosts

**Download VirtualBox**

The VirtualBox Extension Pack is available for personal and educational use on this page under the PUEL license. The VirtualBox Extension Pack is also available under commercial or enterprise terms. By downloading, you agree to the terms and conditions of the respective license.

**VirtualBox Platform Packages**

VirtualBox 7.1.12 platform packages

- Windows hosts
- macOS / Intel hosts
- macOS / Apple Silicon hosts
- Linux distributions
- Solaris hosts
- Solaris 11 IPS hosts

Platform packages are released under the terms of the [GPL version 3](#)

**VirtualBox Extension Pack**  
VirtualBox 7.1.12 Extension Pack

This VirtualBox Extension Pack Personal Use and Educational License governs your access to and use of the VirtualBox Extension Pack. It does not apply to the VirtualBox base package and/or its source code, which are licensed under version 3 of the GNU General Public License "GPL".

See our [FAQ](#) for answers to common questions.

**VirtualBox Extension Pack Personal Use and Educational License (PUEL)**

[PUEL License FAQ](#) [PUEL License Text](#) [Accept and download](#)

# 選取 Windows hosts

- 檔名: VirtualBox-7.1.12-169651-Win.exe
- 安裝 Oracle VirtualBox



# 步驟2 下載並安裝 VirtualBox Extension Pack

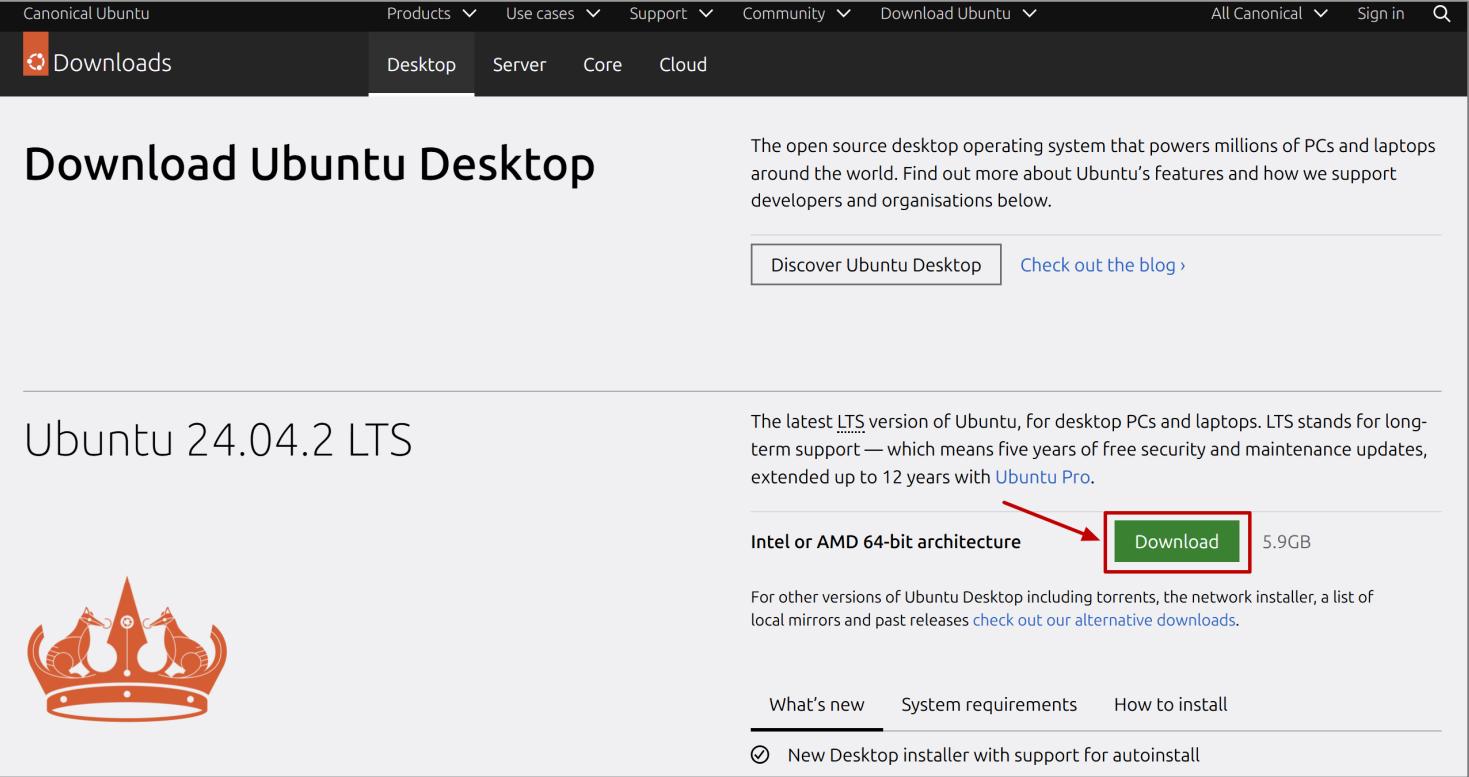
- 檔名: Oracle\_VirtualBox\_Extension\_Pack-7.1.12.vbox-extpack
- 安裝 VirtualBox Extension Pack



## 2.Ubuntu下載與安裝

# Ubuntu下載

- <https://ubuntu.com/download/desktop>



The screenshot shows the Ubuntu download page. At the top, there's a navigation bar with links for Canonical Ubuntu, Products, Use cases, Support, Community, Download Ubuntu, All Canonical, Sign in, and a search icon. Below the navigation, there are tabs for Downloads, Desktop (which is selected), Server, Core, and Cloud. The main heading is "Download Ubuntu Desktop". To the right, a description states: "The open source desktop operating system that powers millions of PCs and laptops around the world. Find out more about Ubuntu's features and how we support developers and organisations below." Below this, there are two buttons: "Discover Ubuntu Desktop" and "Check out the blog". The main content area features a section for "Ubuntu 24.04.2 LTS". It includes a small orange crown icon and a brief description: "The latest LTS version of Ubuntu, for desktop PCs and laptops. LTS stands for long-term support — which means five years of free security and maintenance updates, extended up to 12 years with Ubuntu Pro." A red arrow points to the "Download" button, which is highlighted with a green border. Below the LTS section, there's a link for "Intel or AMD 64-bit architecture" and a file size of "5.9GB". At the bottom, there are links for "What's new", "System requirements", "How to install", and a note about a "New Desktop installer with support for autoinstall".

# Ubuntu下載 (續)

- Signup 視窗可以不用輸入資料, 下載完成後關閉視窗
- 檔名: ubuntu-24.04.2-desktop-amd64.iso

The screenshot shows the Canonical Ubuntu Downloads page. At the top, there's a navigation bar with links for Products, Use cases, Support, Community, Download Ubuntu, All Canonical, Sign in, and a search icon. Below the navigation, there's a main header with the Canonical logo and the word "Downloads". A sub-navigation bar below it includes Desktop, Server, Core, and Cloud. The main content area has two main sections: one on the left for desktop download confirmation and one on the right for newsletter sign-up.

**Left Section (Desktop Download Confirmation):**

**Right Section (Newsletter Sign-up):**

Sign up for our newsletter  
Get the latest Ubuntu news and updates in your inbox.

\* Email: \_\_\_\_\_

How do you plan to use Ubuntu Desktop?  
 Work    Education    Personal use

I agree to receive information about Canonical's products and services.

By submitting this form, I confirm that I have read and agree to [Canonical's Privacy Notice](#) and [Privacy Policy](#).

**Bottom Buttons:**

Subscribe now

RESOURCES      HELP IS ALWAYS AT HAND

# Ubuntu 安裝

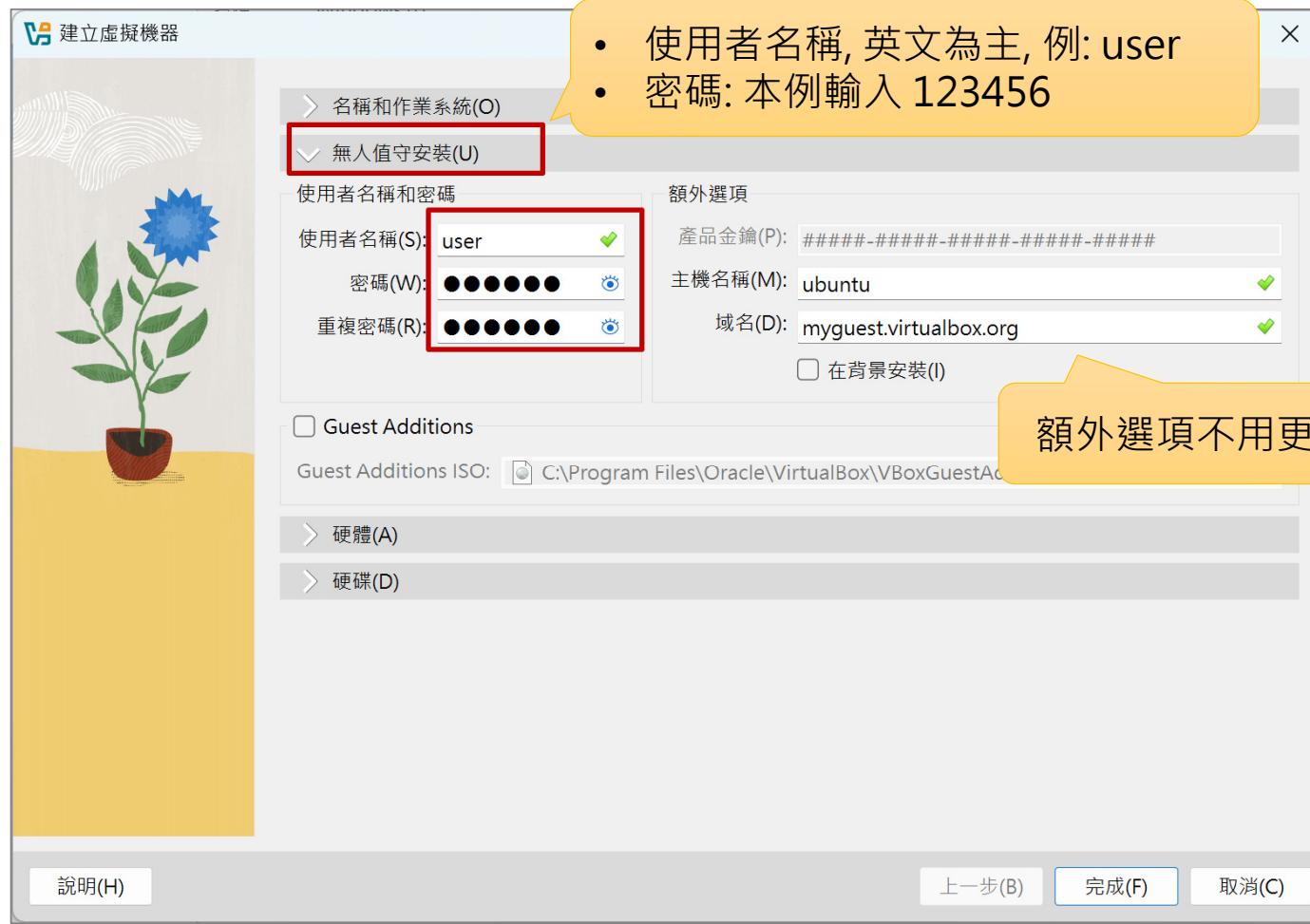
- 開啟 Oracle VirtualBox \ 新增



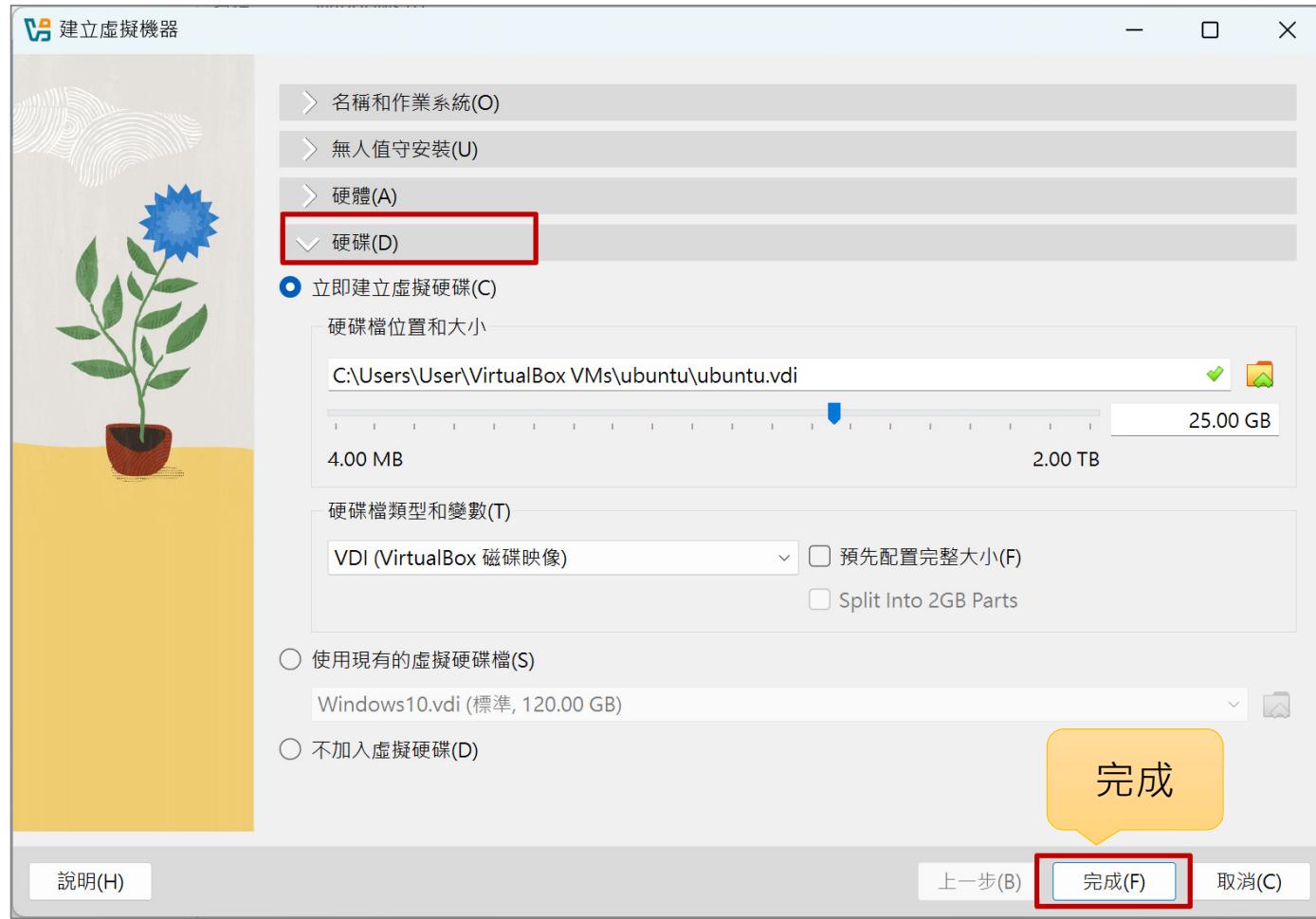
# 建立虛擬機 \ 名稱和作業系統



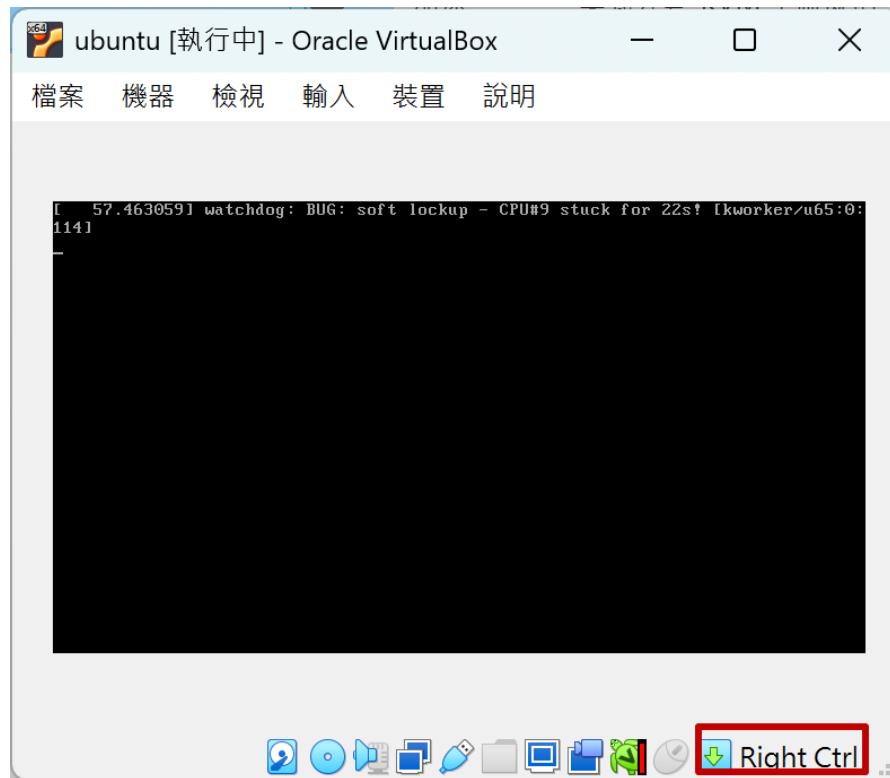
# 建立虛擬機 \ 無人值守安裝



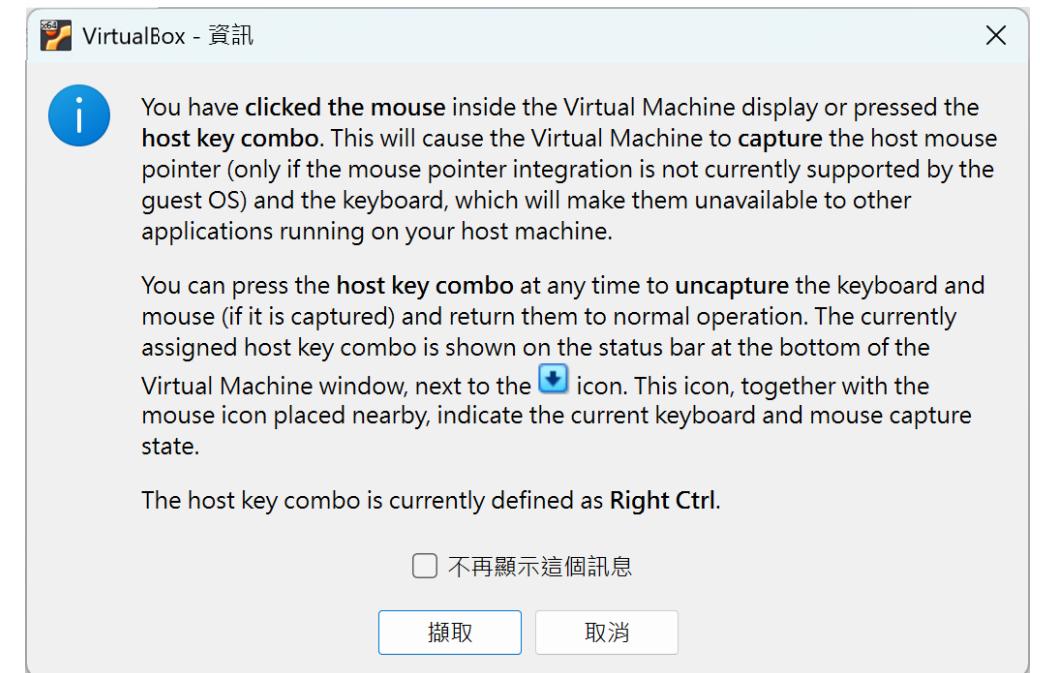
# 建立虛擬機 \ 硬體



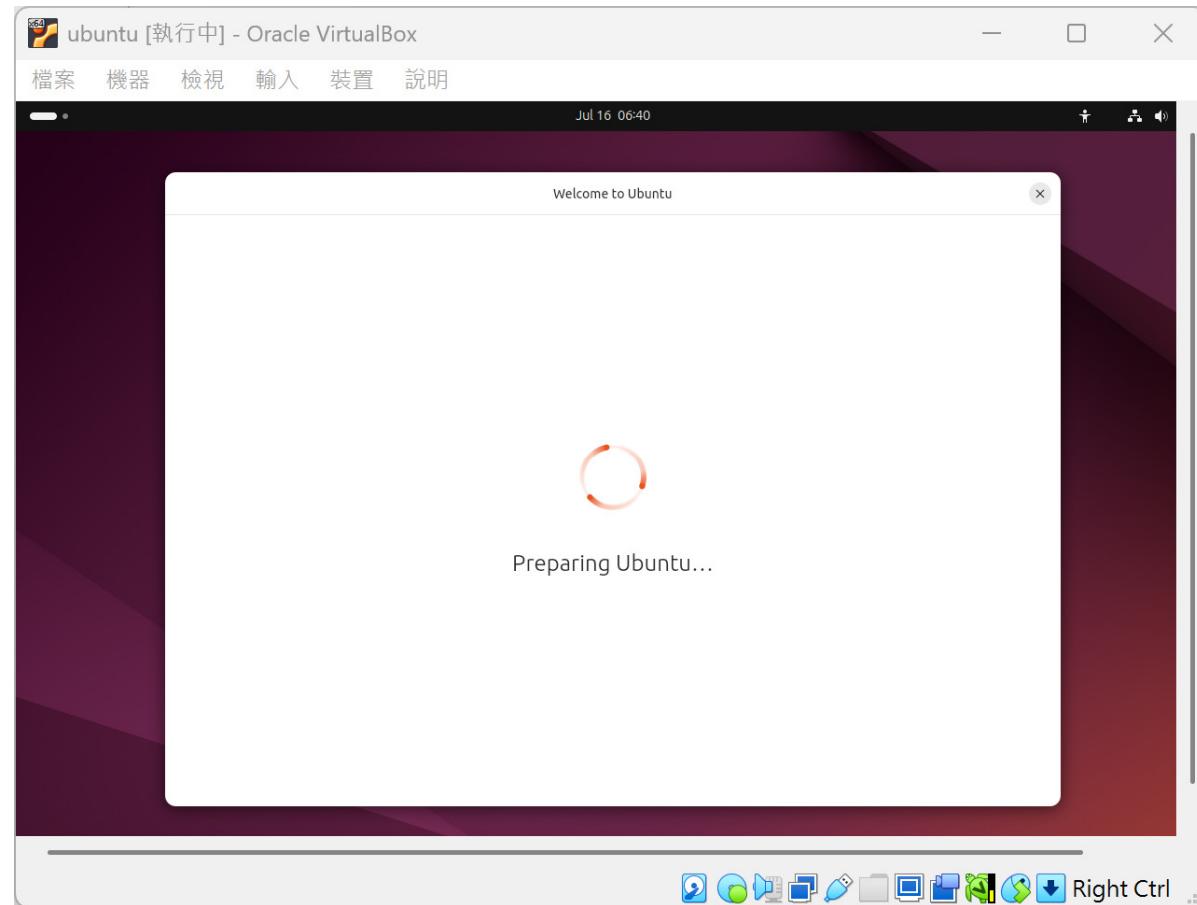
# 安裝畫面



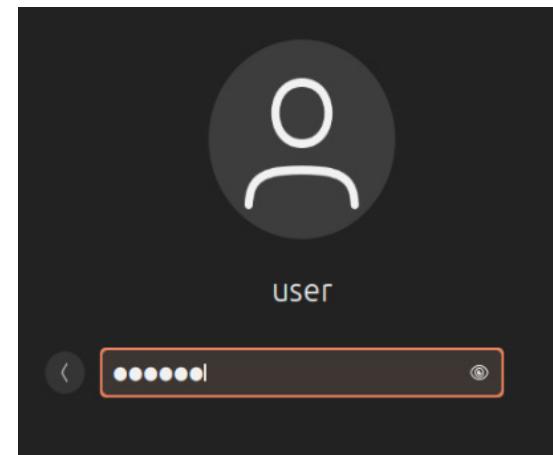
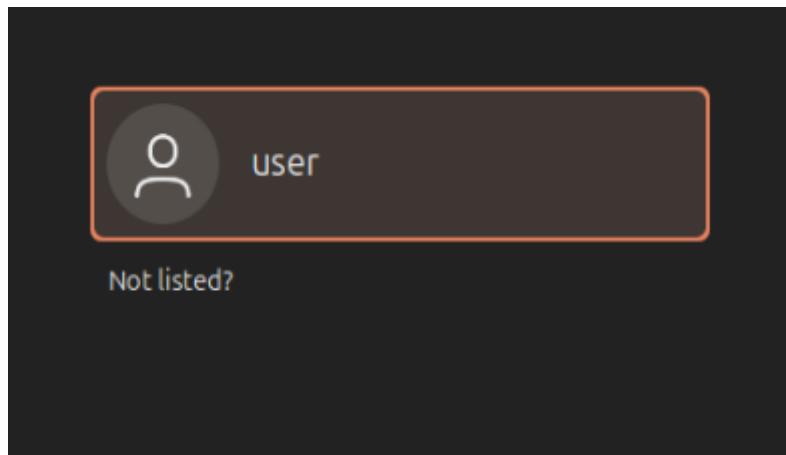
按右邊 Ctrl: 切換至 VM

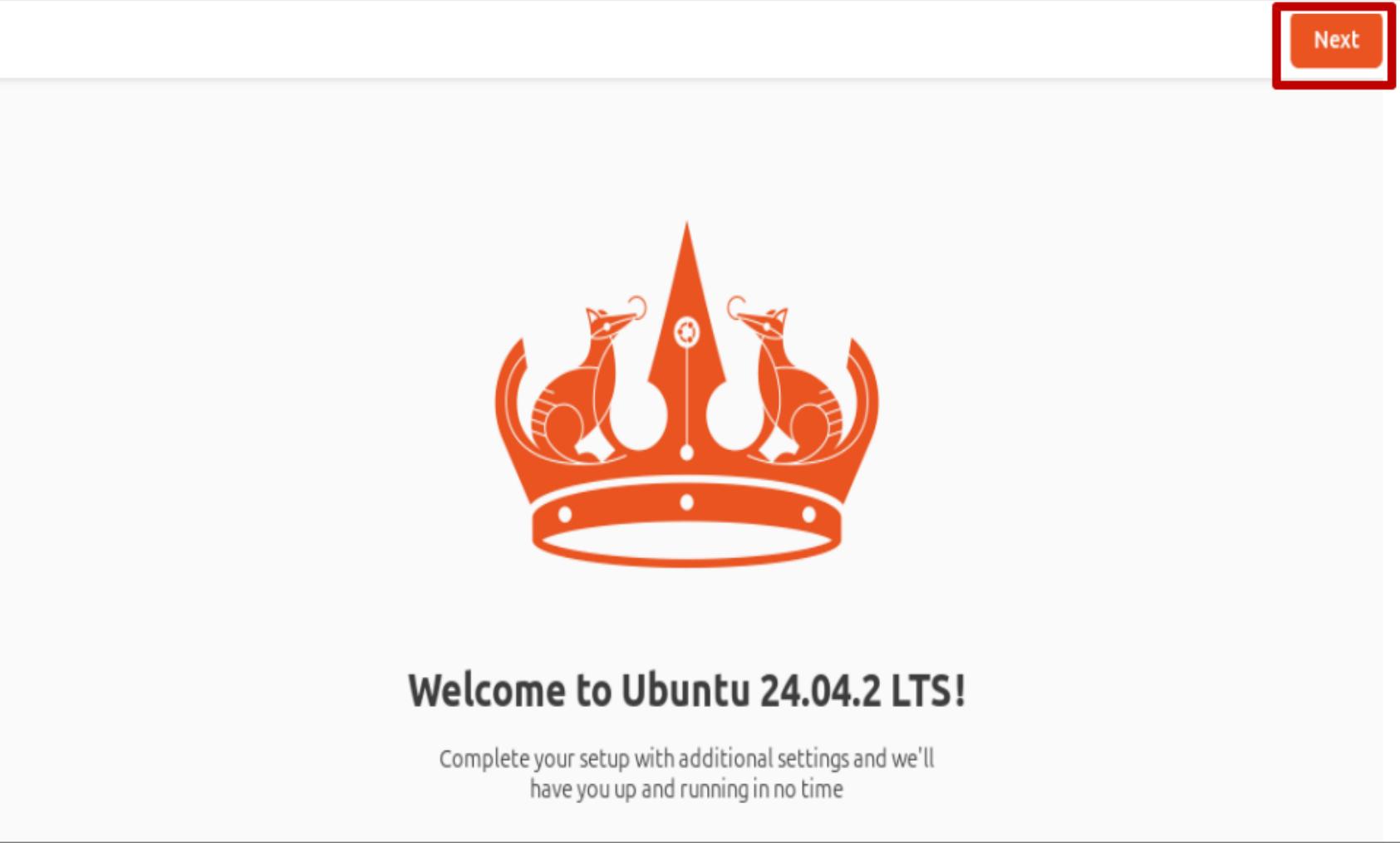


# 安裝畫面



# 登入 user



A screenshot of the Ubuntu 24.04.2 LTS setup screen. It features a large orange crown icon in the center. Below the crown, the text "Welcome to Ubuntu 24.04.2 LTS!" is displayed in a bold, sans-serif font. Underneath that, a smaller text says "Complete your setup with additional settings and we'll have you up and running in no time". In the top right corner, there is a red rectangular button with the word "Next" in white text.

Next



## Welcome to Ubuntu 24.04.2 LTS!

Complete your setup with additional settings and we'll  
have you up and running in no time

Ubuntu Pro

Skip

# Ubuntu Pro

## Enable Ubuntu Pro

Upgrade this machine to Ubuntu Pro. Free for up to 5 machines.

- Get security updates on a wide range of packages until 2034
- Fulfill FedRAMP, FIPS, STIG and HIPAA and other compliance and hardening requirements with certified tooling and crypto-modules.

Learn more at [ubuntu.com/pro](https://ubuntu.com/pro).

Enable Ubuntu Pro now, or skip this step.

Enable Ubuntu Pro

Skip for now

You can always enable Ubuntu Pro later via the Software & Updates application

2

1

Skip for now

Previous                                  Help improve Ubuntu                          Next



## Help improve Ubuntu

Help us improve Ubuntu by sharing your system data with us. This includes things like your machine model, installed software and the location you chose for your timezone.

Yes, share system data with the Ubuntu team

No, don't share system data

No, don't share system data

Show the First Report   Legal notice

Previous Ready to go Finish

## Get started with more applications

Ubuntu's App Center has a range of apps you can get started with.

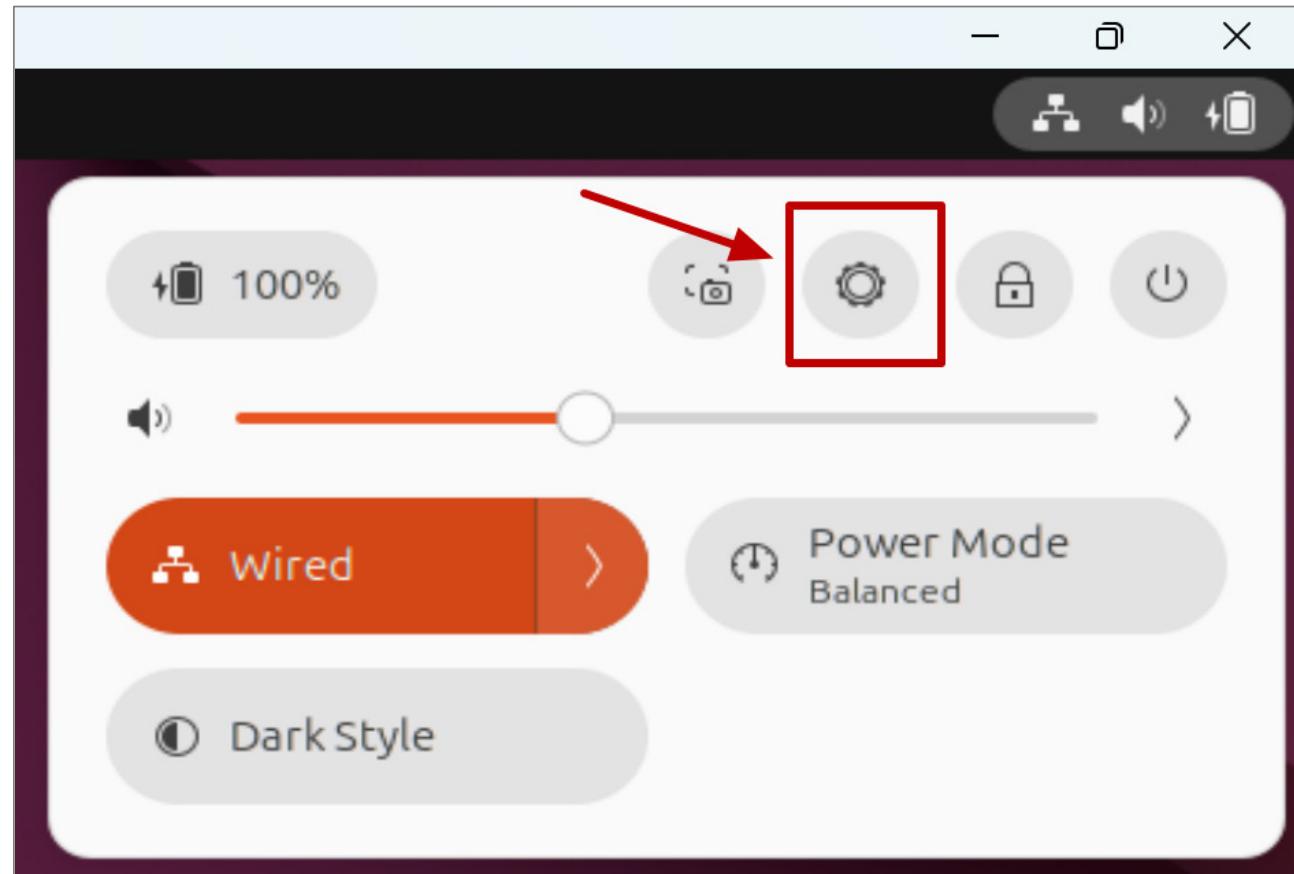
Open App Center

Finish

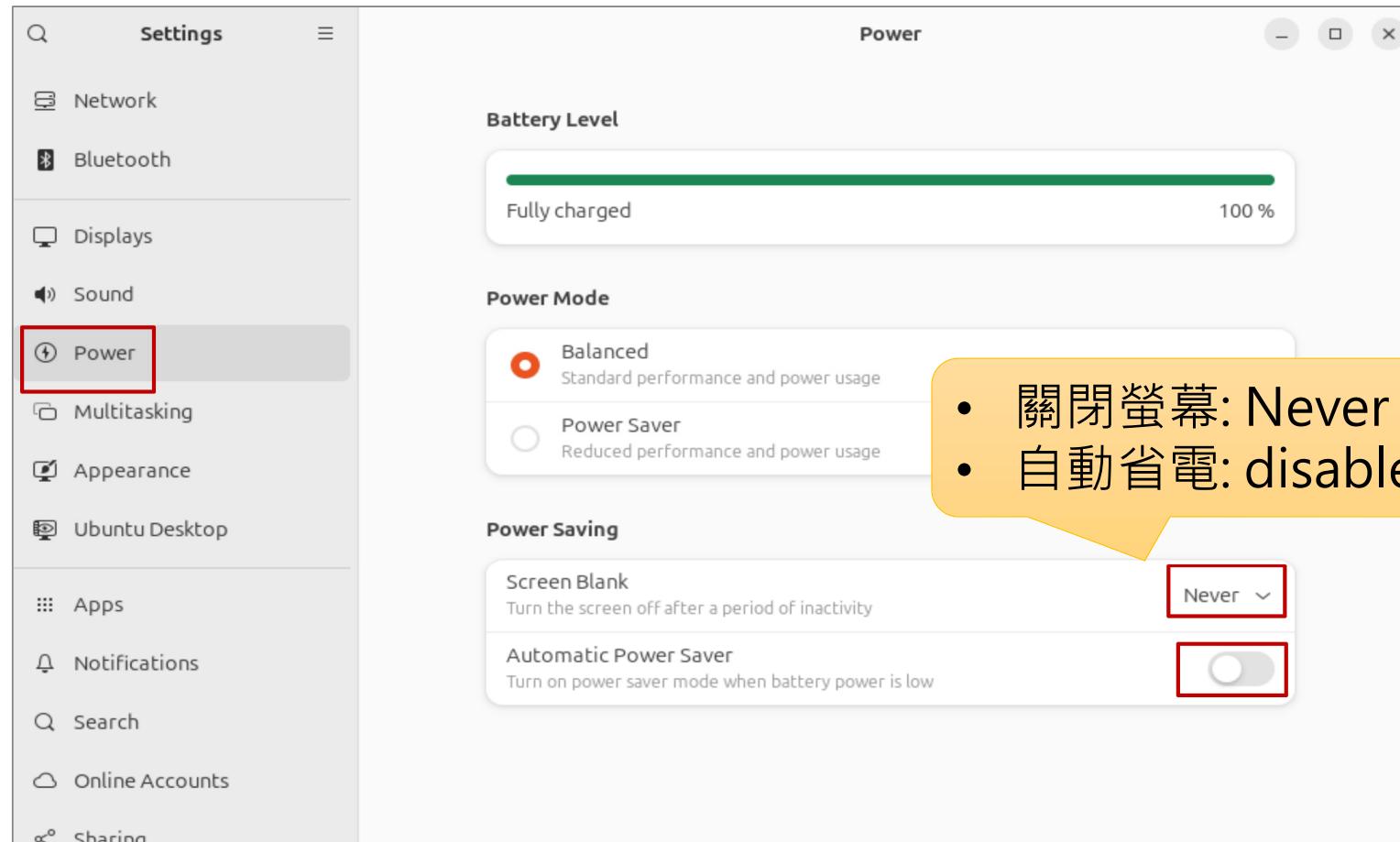
# Ubuntu 操作

---

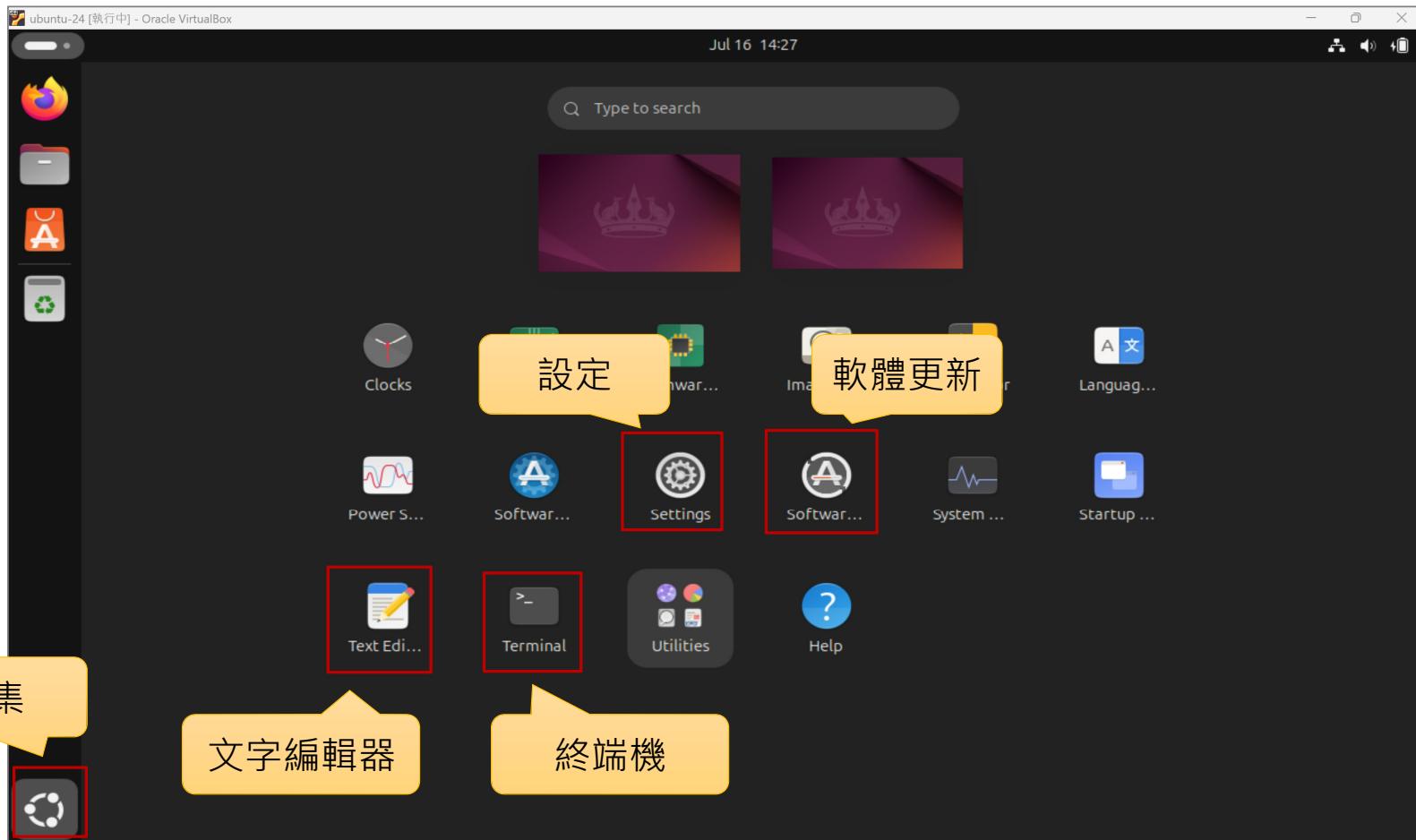
# Settings 設定視窗



# Settings \ Power 電源設定



# 左下角 程式集



# 終端機安裝 Google Chrome

```
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

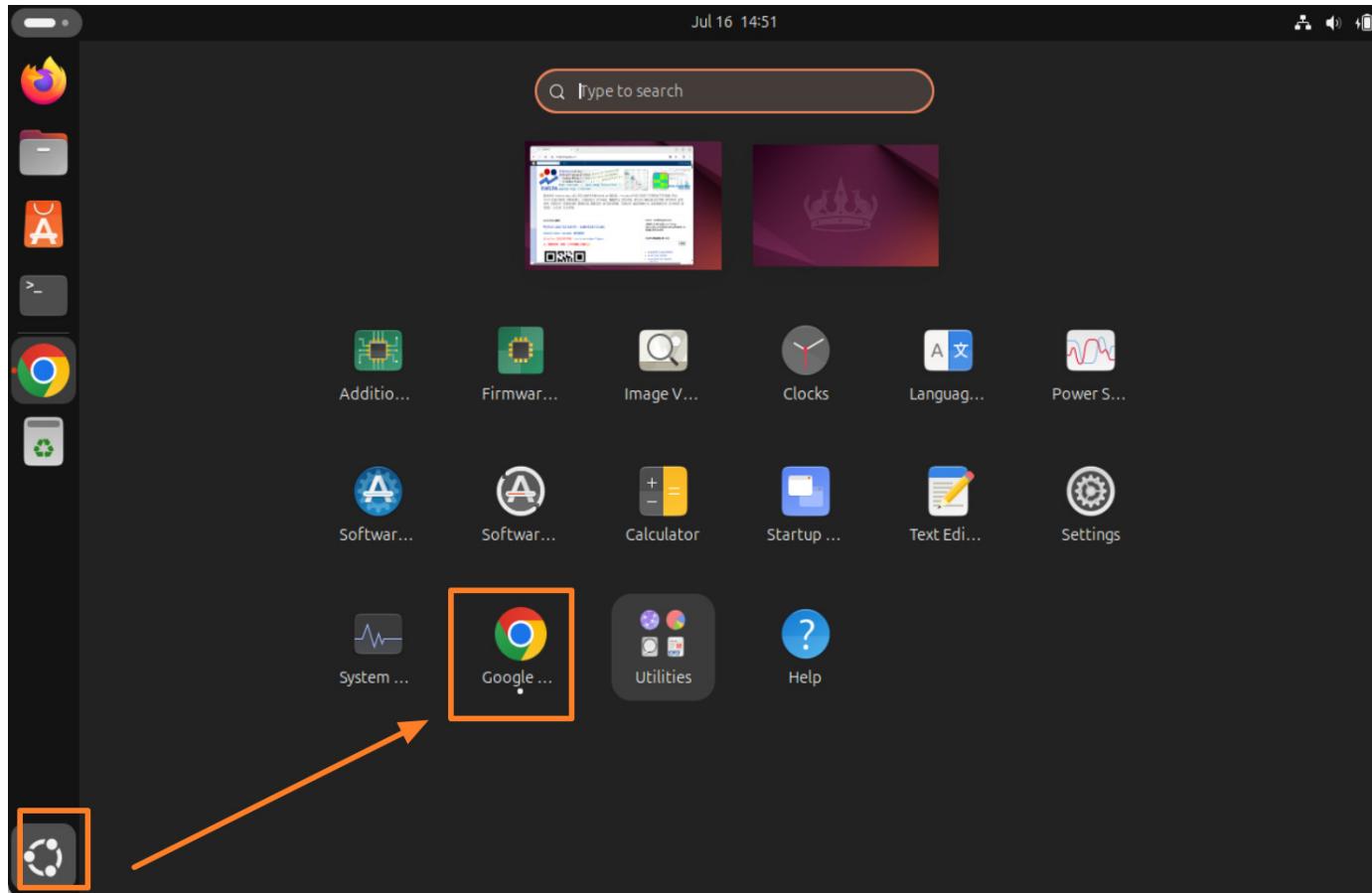
user@ubuntu-24:~$ cd Downloads/
user@ubuntu-24:~/Downloads$ ls -al
total 115428
drwxr-xr-x  2 user user      4096 Jul 16 14:25 .
drwxr-x--- 15 user user      4096 Jul 16 14:38 ..
-rw-rw-r--  1 user user 118188228 Jul 16 14:25 google-chrome-stable_current_amd64.deb
user@ubuntu-24:~/Downloads$ sudo dpkg -i google-chrome-stable_current_amd64.deb
[sudo] password for user:
Selecting previously unselected package google-chrom...
```

- cd Downloads/
- ls -al
- sudo dpkg -i google-chrome-stable\_current\_amd64.deb

```
update-alternatives: using /usr/bin/google-chrome-stable to provide /usr/bin/google-chrome (google-chrome) in auto mode
Processing triggers for gnome-menus (3.36.0-1.1ubuntu3) ...
Processing triggers for desktop-file-utils (0.23.1-1ubuntu1.1build1) ...
Processing triggers for man-db (2.8.3-2ubuntu0.2) ...
user@ubuntu-24:~/Downloads$
```

關閉視窗: exit

# Google Chrome-完成版

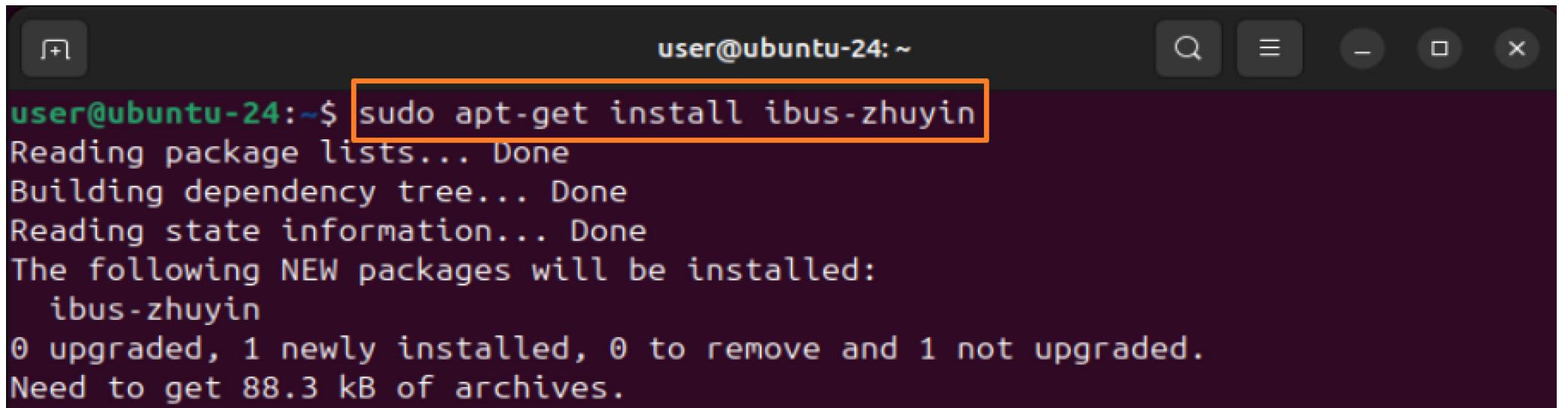


# 安裝中文輸入法

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# 注音輸入法

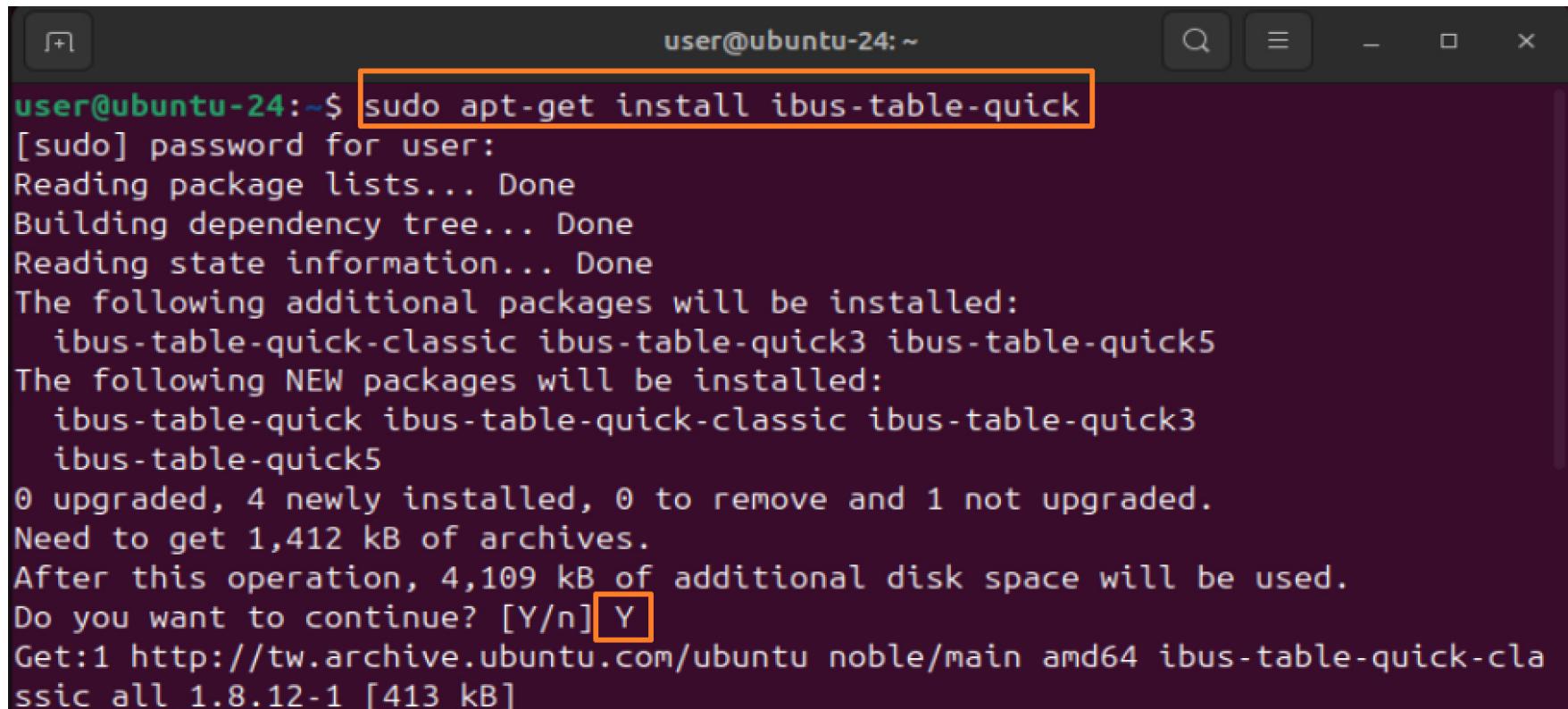
- sudo apt-get install ibus-zhuyin



```
user@ubuntu-24:~$ sudo apt-get install ibus-zhuyin
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  ibus-zhuyin
0 upgraded, 1 newly installed, 0 to remove and 1 not upgraded.
Need to get 88.3 kB of archives.
```

# 速成輸入法

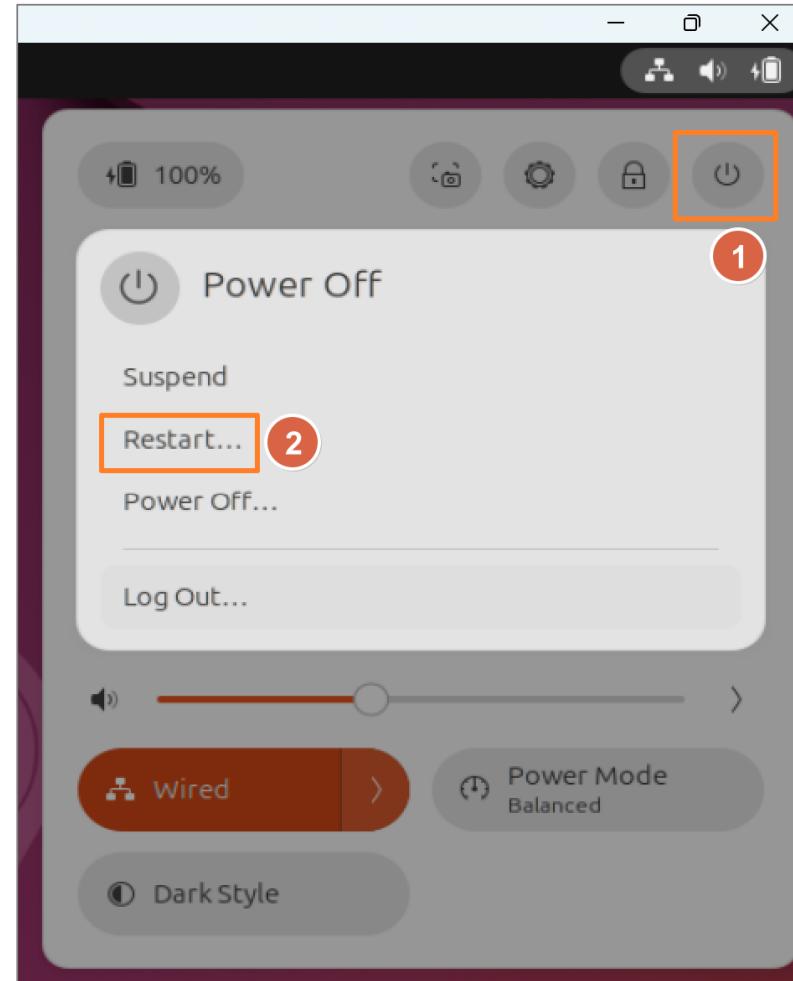
- sudo apt-get install ibus-table-quick



The screenshot shows a terminal window with a dark background and light-colored text. The title bar says "user@ubuntu-24: ~". The command "sudo apt-get install ibus-table-quick" is highlighted with a red rectangle. The terminal output shows the package being installed, including dependencies like ibus-table-quick-classic, ibus-table-quick3, and ibus-table-quick5. It also lists new packages to be installed: ibus-table-quick, ibus-table-quick-classic, ibus-table-quick3, and ibus-table-quick5. The message indicates 0 upgraded, 4 newly installed, 0 to remove, and 1 not upgraded. It shows the need to get 1,412 kB of archives and the disk space required after the operation. The final prompt asks if the user wants to continue with "Y" highlighted by a red rectangle.

```
user@ubuntu-24:~$ sudo apt-get install ibus-table-quick
[sudo] password for user:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  ibus-table-quick-classic ibus-table-quick3 ibus-table-quick5
The following NEW packages will be installed:
  ibus-table-quick ibus-table-quick-classic ibus-table-quick3
  ibus-table-quick5
0 upgraded, 4 newly installed, 0 to remove and 1 not upgraded.
Need to get 1,412 kB of archives.
After this operation, 4,109 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://tw.archive.ubuntu.com/ubuntu noble/main amd64 ibus-table-quick-cla
ssic all 1.8.12-1 [413 kB]
```

# 重新啟動電腦



# Settings \ Keyboard \ Input Sources

The screenshot shows the Ubuntu Settings window with the 'Keyboard' option selected (marked with a red box and number 1). The main pane displays the 'Input Sources' configuration, which includes 'English (US)' and three Chinese input methods: 'Chinese (Quick3)' (selected and highlighted with a red box and number 3), 'Chinese (Zhuyin)', and 'Chinese (Pinyin)'. A red box and number 2 surrounds the '+ Add Input Source...' button. Below this, the 'Input Source Switching' section contains two radio button options: 'Use the same source for all windows' (selected) and 'Switch input sources individually for each window'. At the bottom, the 'Special Character Entry' section is visible.

速成輸入法  
注音輸入法

1

2

3

Input Sources

Includes keyboard layouts and input methods

English (US)

Chinese (Quick3)

Chinese (Zhuyin)

+ Add Input Source...

Input Source Switching

Use the same source for all windows

Switch input sources individually for each window

Special Character Entry

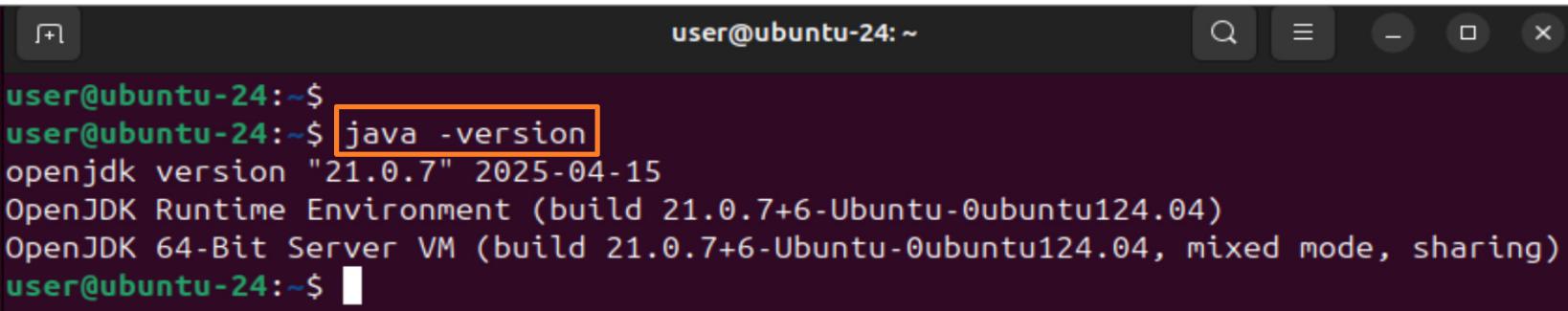
Methods for entering symbols and letter variants using the keyboard

# 安裝 Open Java

---

# 安裝 Open Java

- # 安裝 Open Java
  - sudo apt-get install default-jre
  - sudo apt-get install default-jdk
- 
- # 顯示 Java 安裝版本
  - java -version



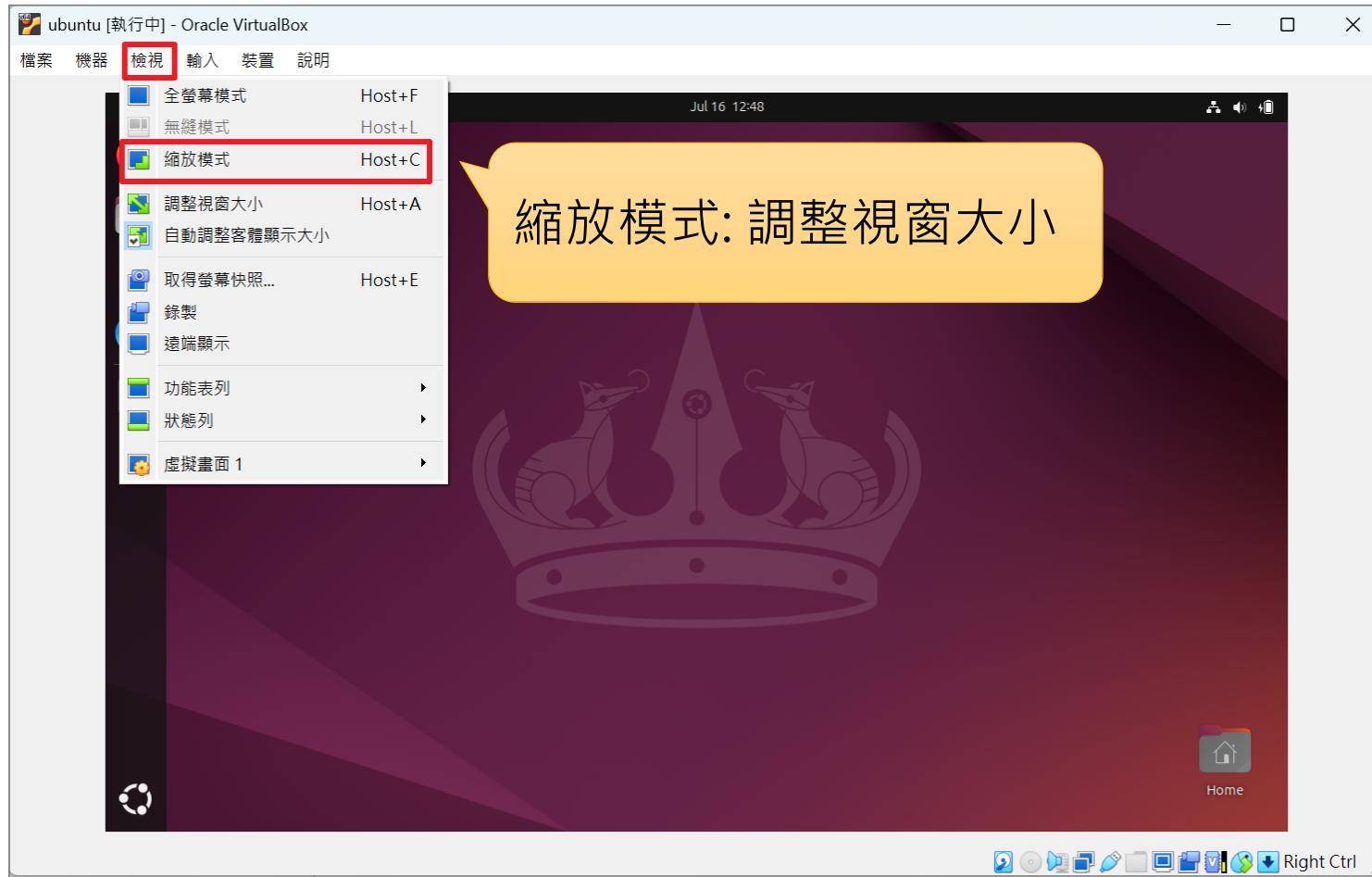
A screenshot of a terminal window titled "user@ubuntu-24: ~". The window shows the command "java -version" being run and its output. The output indicates that OpenJDK version 21.0.7 is installed, built on April 15, 2025, for the OpenJDK Runtime Environment and OpenJDK 64-Bit Server VM.

```
user@ubuntu-24:~$ java -version
openjdk version "21.0.7" 2025-04-15
OpenJDK Runtime Environment (build 21.0.7+6-Ubuntu-0ubuntu124.04)
OpenJDK 64-Bit Server VM (build 21.0.7+6-Ubuntu-0ubuntu124.04, mixed mode, sharing)
user@ubuntu-24:~$
```

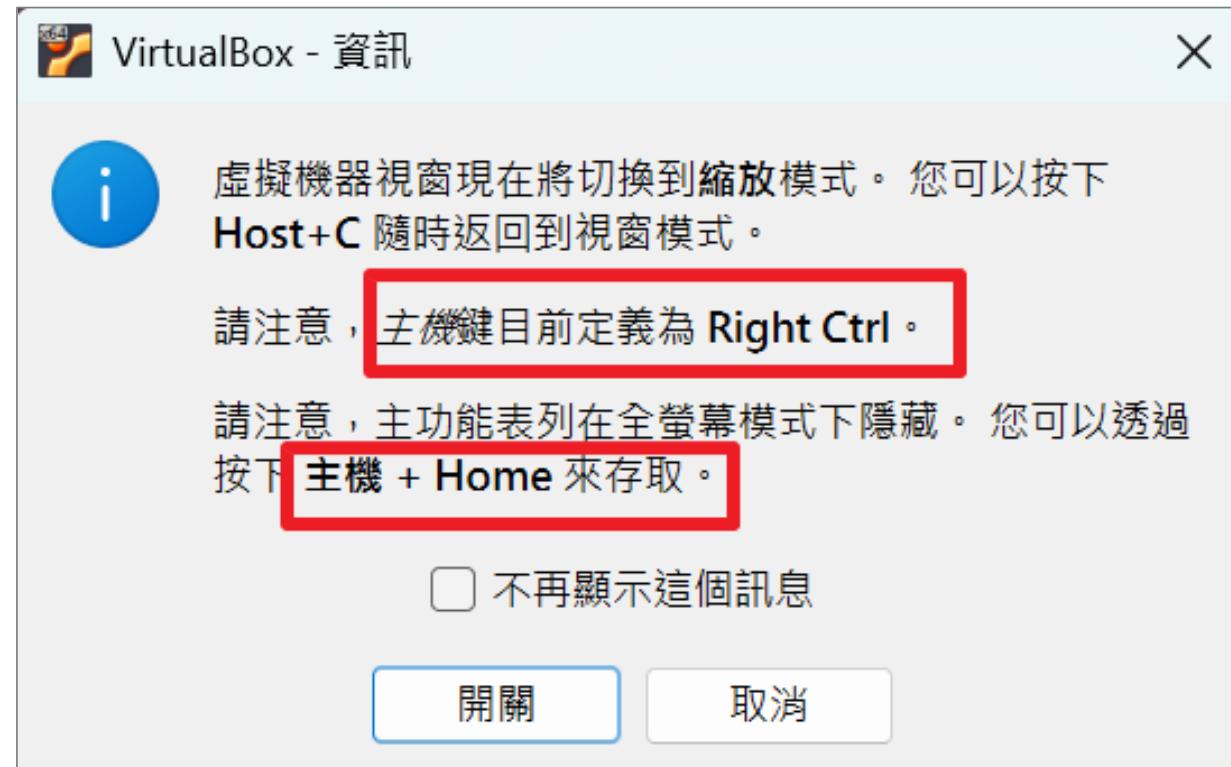
# VirtualBox 設定

---

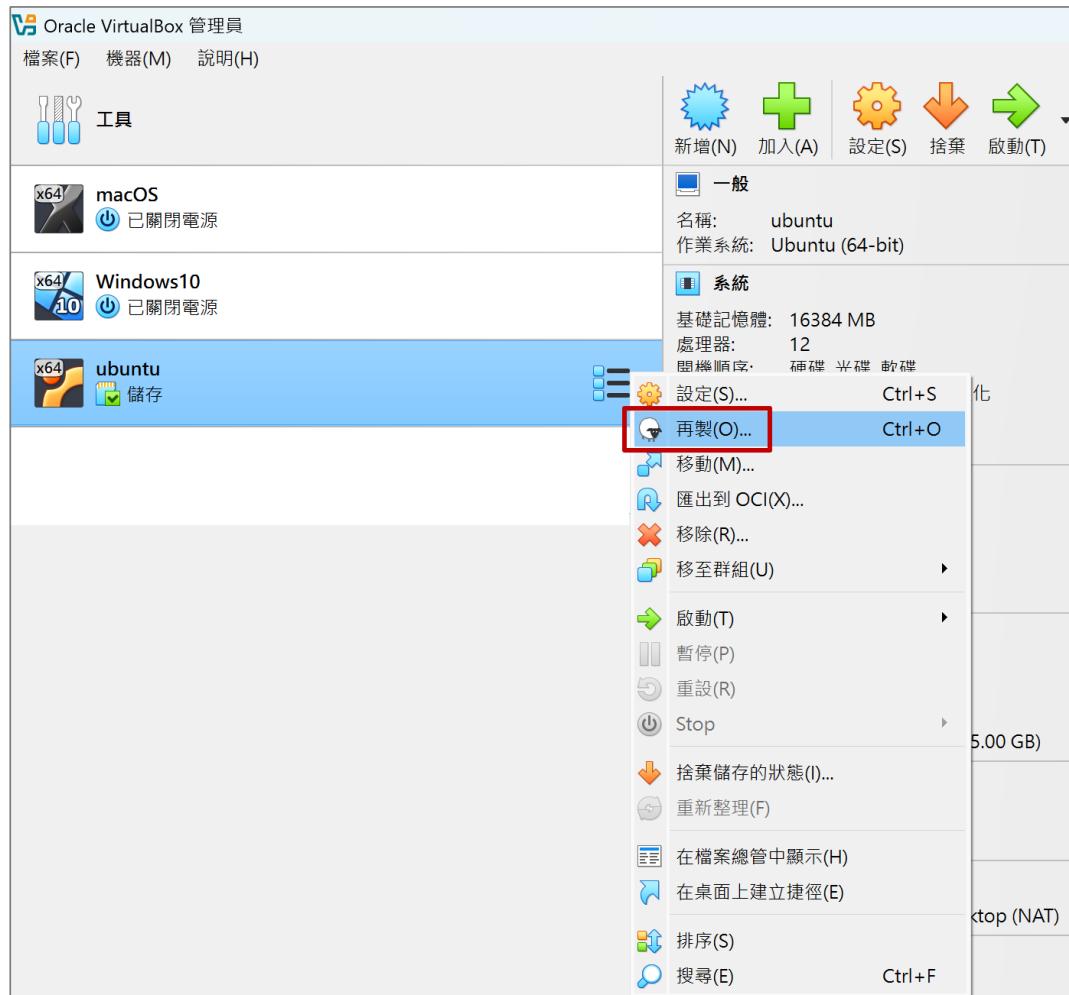
# 檢視 \ 縮放模式



# 主功能表列: 右邊 Ctrl + Home

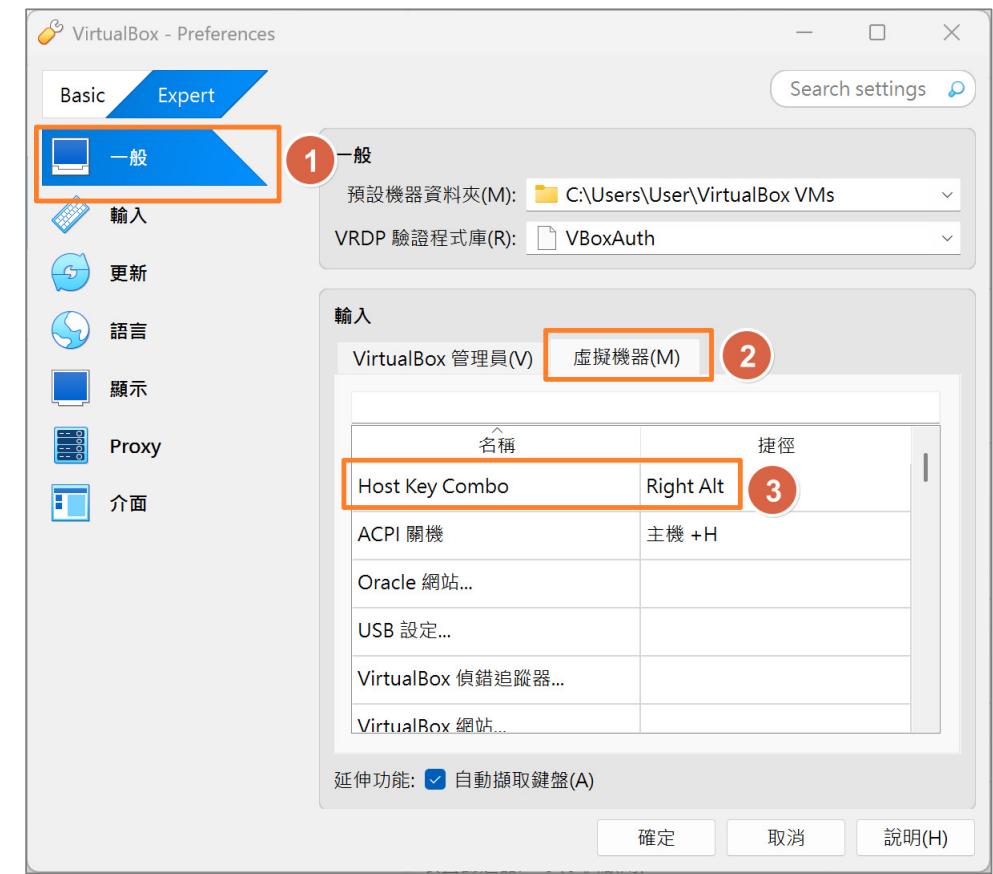
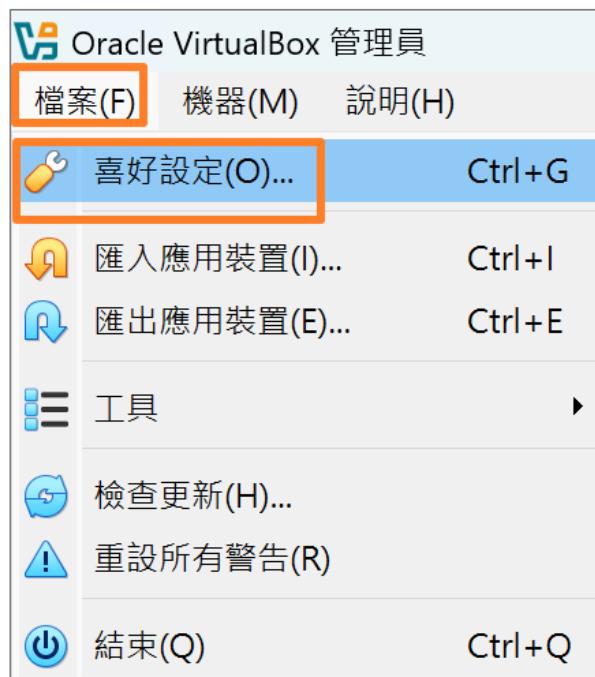


# 再製 (Clone)



# 設定主機快速鍵

1. 檔案 \ 喜好設定
2. 一般 \ 虛擬機器 \ Host Key Combo  
本例為右邊 Alt鍵



# Ubuntu 使用 | 進行管線操作

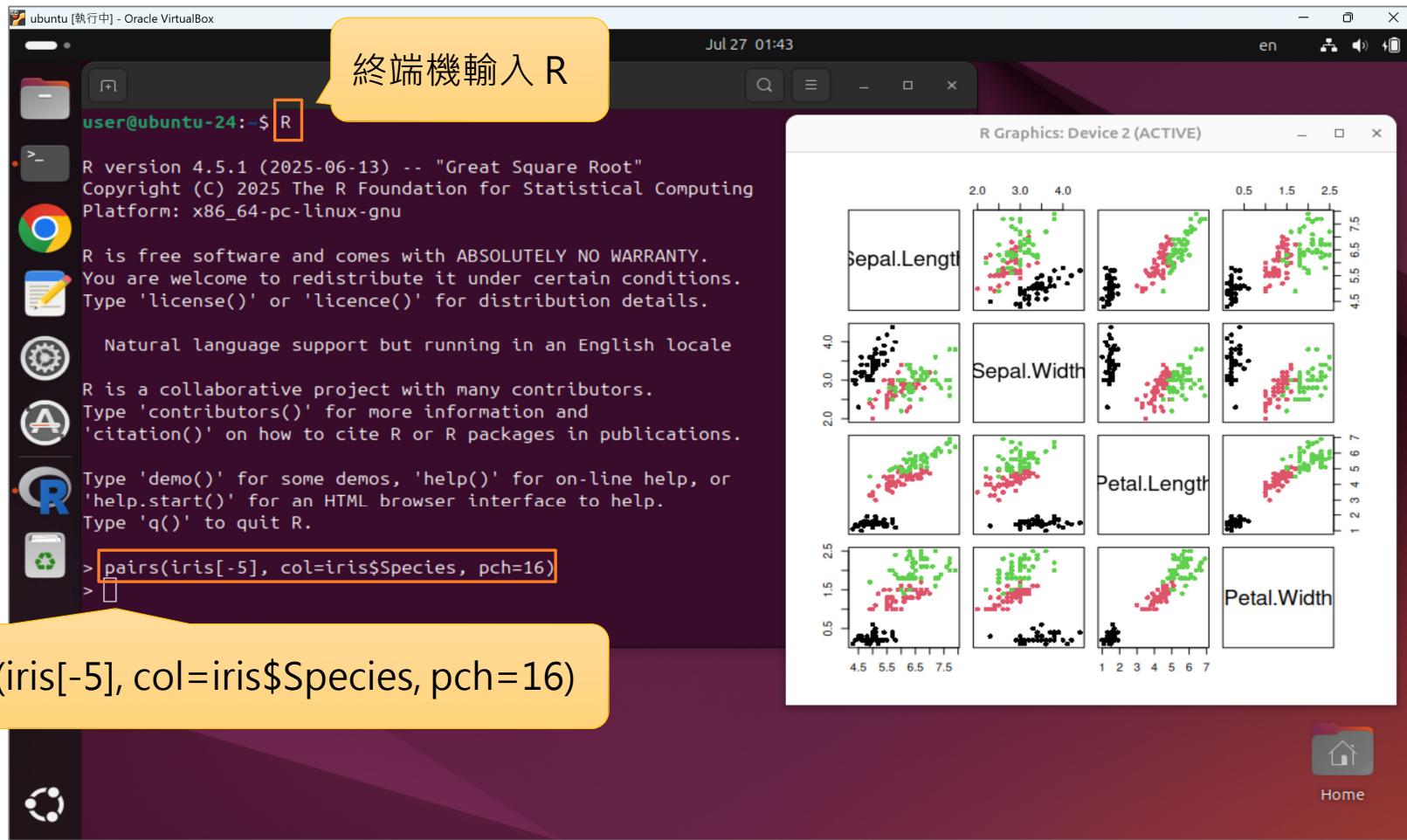
```
user@ubuntu-24: ~/Downloads
user@ubuntu-24:~/Downloads$ cat ai.txt
RWEPA
R
Python
AI
user@ubuntu-24:~/Downloads$ cat ai.txt | sort
AI
Python
R
RWEPA
user@ubuntu-24:~/Downloads$
```

## 3.Ubuntu + R 安裝

# 安裝 R

- # 更新安裝套件的來源庫
- sudo apt-get update
- # 安裝2個 helper 套件
- sudo apt install software-properties-common dirmngr
- # 新增簽章金鑰 (by Michael Rutter)
- # To verify key, run gpg --show-keys /etc/apt/trusted.gpg.d/cran\_ubuntu\_key.asc
- # Fingerprint: E298A3A825C0D65DFD57CBB651716619E084DAB9
- wget -qO- https://cloud.r-project.org/bin/linux/ubuntu/marutter\_pubkey.asc | sudo tee -a /etc/apt/trusted.gpg.d/cran\_ubuntu\_key.asc
- # 新增 CRAN 來源庫
- sudo add-apt-repository "deb https://cloud.r-project.org/bin/linux/ubuntu \$(lsb\_release -cs)-cran40/"
- # 安裝 R 等核心套件
- sudo apt install r-base r-base-core r-recommended r-base-dev

# Ubuntu – R 完成畫面



The screenshot shows an Ubuntu desktop environment with a terminal window and a scatter plot matrix.

**Terminal Window:**

- User: user@ubuntu-24:~\$
- R version 4.5.1 (2025-06-13) -- "Great Square Root"
- Copyright (C) 2025 The R Foundation for Statistical Computing
- Platform: x86\_64-pc-linux-gnu
- 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.
- Natural language support but running in an English locale
- 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.
- > pairs(iris[-5], col=iris\$Species, pch=16)

**Scatter Plot Matrix:**

A 4x4 grid of scatter plots showing relationships between four variables: Sepal.Length, Sepal.Width, Petal.Length, and Petal.Width. The diagonal elements are histograms of each variable. The off-diagonal elements show scatter plots colored by Species (black, red, green).

**Annotations:**

- A yellow callout bubble points to the terminal window with the text "終端機輸入 R".
- A yellow callout bubble points to the R command in the terminal with the text "pairs(iris[-5], col=iris\$Species, pch=16)".

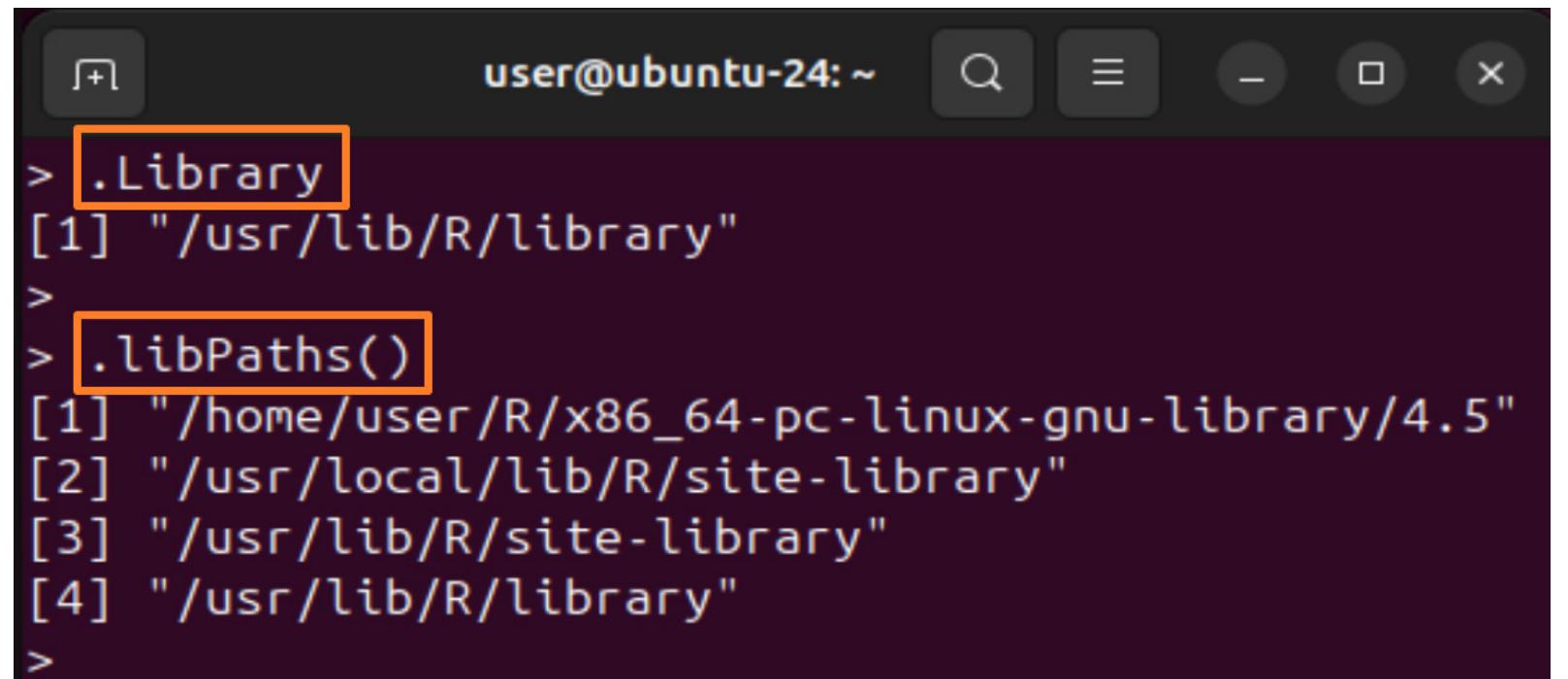
# Java 組態管理

- # 開啟 R 進行 Java 組態管理
- sudo -i R CMD javareconf
  
- # 安裝 rJava 等套件
- sudo -i R
- install.packages(c("rJava", "ggplot2", "dplyr", "shiny"))

# 套件安裝目錄

- # 基礎套件安裝目錄
- `.Library`

- # 套件安裝目錄
- `.libPaths()`



```
user@ubuntu-24: ~
> .Library
[1] "/usr/lib/R/library"
>
> .libPaths()
[1] "/home/user/R/x86_64-pc-linux-gnu-library/4.5"
[2] "/usr/local/lib/R/site-library"
[3] "/usr/lib/R/site-library"
[4] "/usr/lib/R/library"
```

## 4.Ubuntu + RStudio 安裝

# 安裝 RStudio

- # 安裝相依套件
- sudo apt install libclang-dev libpq5 libssl-dev
  
- # 下載 RStudio
- cd Downloads
- wget <https://download1.rstudio.org/electron/jammy/amd64/rstudio-2025.05.1-513-amd64.deb>
  
- # 安裝 RStudio
- sudo dpkg -i rstudio-2025.05.1-513-amd64.deb
  
- # 開啟 RStudio
- rstudio

# RStudio 畫面

The screenshot shows the RStudio interface with the following components:

- Code Editor:** An untitled R script containing the following code:

```
1 # ubuntu rstudio ggplot2 demo
2 library(ggplot2)
3 ggplot(iris, aes(Sepal.Length, Sepal.Width)) +
4   geom_line(aes(color=Species)) +
5   facet_wrap(~Species, ncol=1)
```
- Console:** Displays the same R code being run in the R 4.5.1 environment.
- Environment:** Shows the Global Environment tab with the message "Environment is empty".
- Plots:** A multi-panel plot showing Sepal.Length on the x-axis (ranging from 5 to 8) and Sepal.Width on the y-axis (ranging from 2.0 to 4.5). The plot is faceted by Species: setosa (red line), versicolor (green line), and virginica (blue line). The legend indicates the colors for each species: setosa (red), versicolor (green), and virginica (blue).

A yellow callout box highlights the R code in the editor:

```
library(ggplot2)
ggplot(iris, aes(Sepal.Length, Sepal.Width)) +
  geom_line(aes(color=Species)) +
  facet_wrap(~Species, ncol=1)
```

## 5.結論

# Big Data → Ubuntu → R → RStudio



# 謝謝您的聆聽

## Q & A



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**<http://rwepa.blogspot.tw/>**