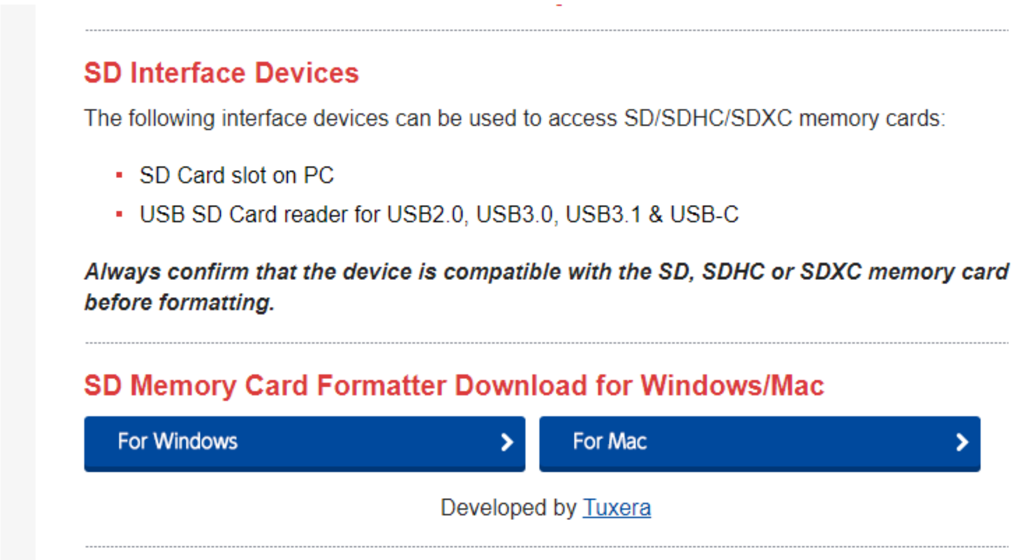
Instruction to start on resberryPi

Step1

Format your sd card

In this case, we will use a software called **SD Card Formatter** to help us formatting our sd card.

Download link



SD Interface Devices

The following interface devices can be used to access SD/SDHC/SDXC memory cards:

- SD Card slot on PC
- USB SD Card reader for USB2.0, USB3.0, USB3.1 & USB-C

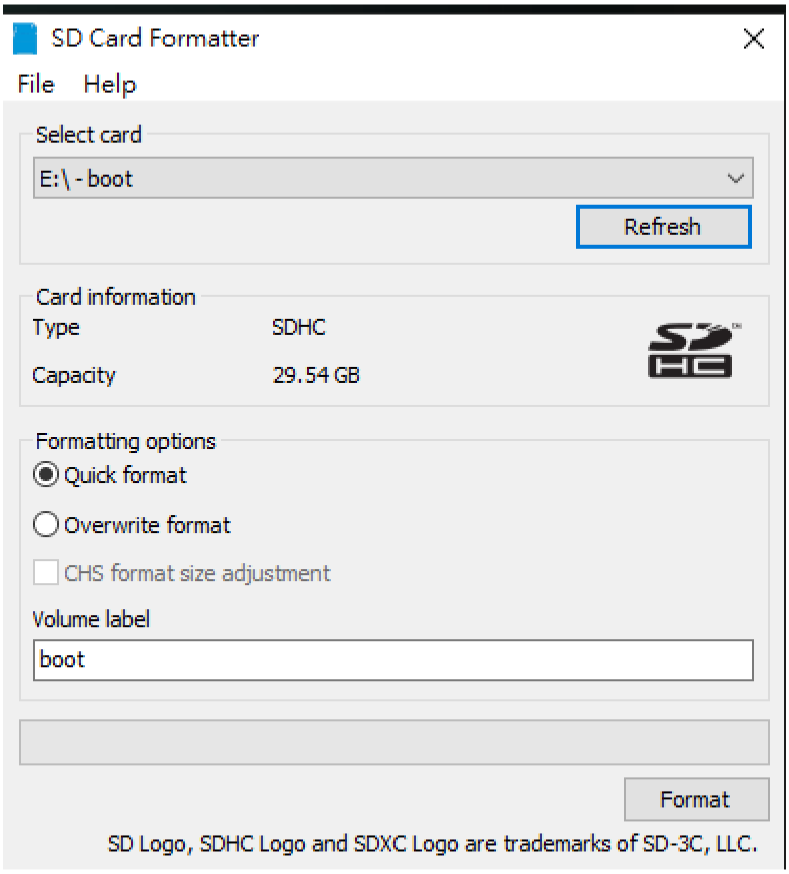
Always confirm that the device is compatible with the SD, SDHC or SDXC memory card before formatting.

SD Memory Card Formatter Download for Windows/Mac

Developed by Tuxera

Select your OS and download it.

After installed and put sd card in your computer, open it and you should come to this:



Select card

E:\ - boot

Card information

Type SDHC

Capacity 29.54 GB

Formatting options

● Quick format

○ Overwrite format

□ CHS format size adjustment

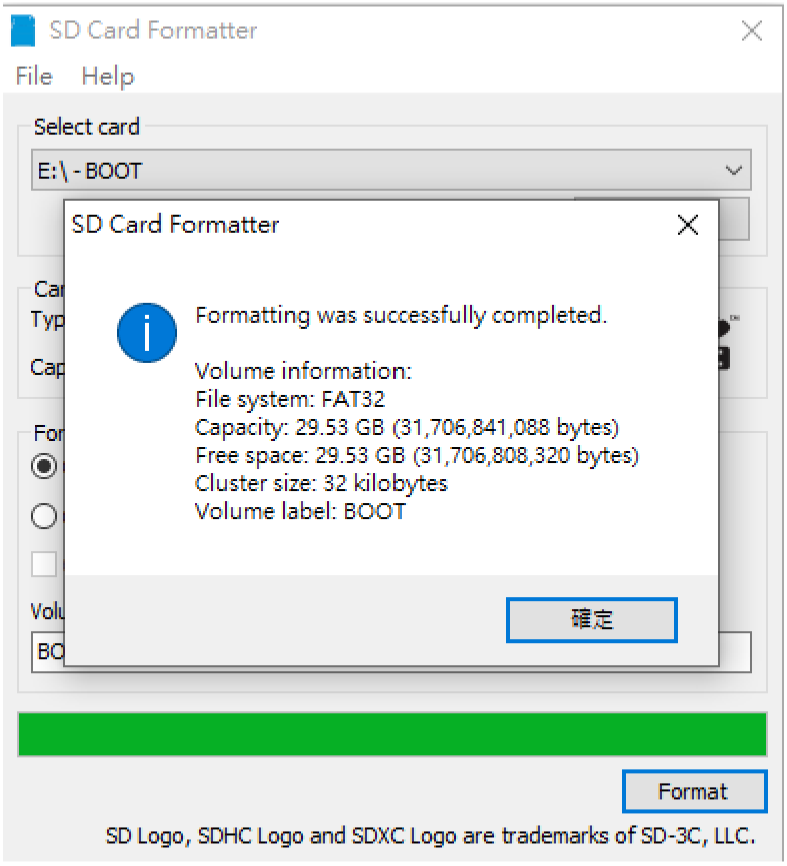
Volume label

boot

SD Logo, SDHC Logo and SDXC Logo are trademarks of SD-3C, LLC.

Choose quick format and click format button.

After successfully formatting, you should end up like this:



Formatting was successfully completed.

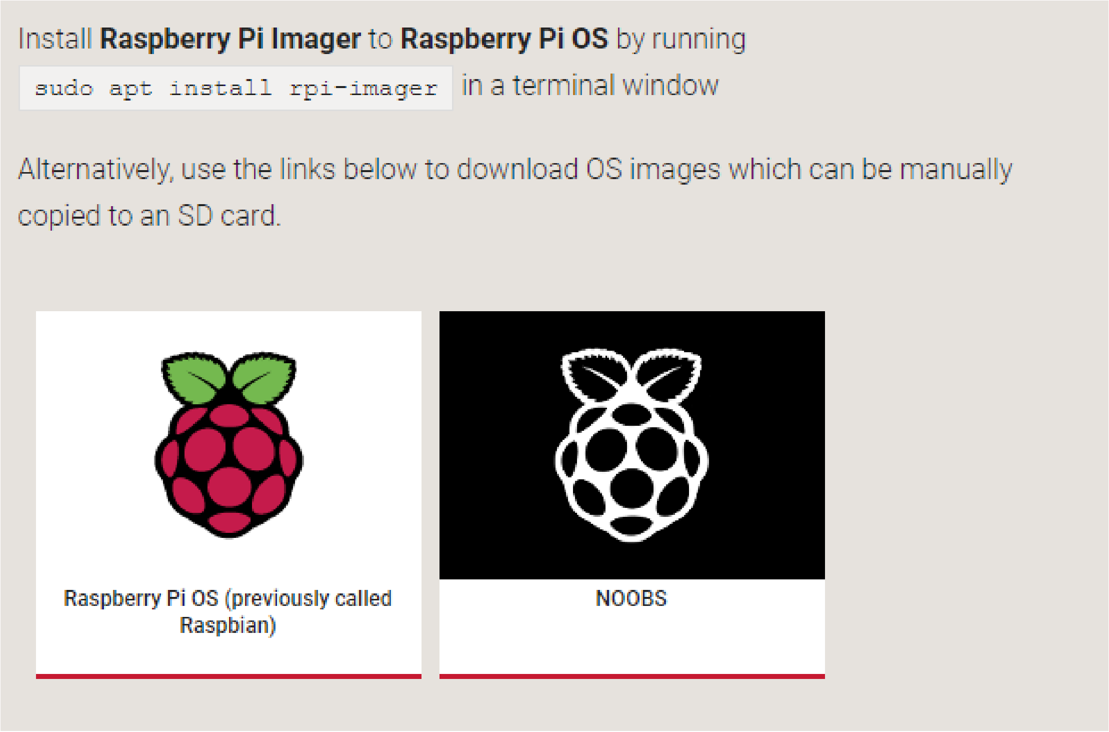
Volume information:
File system: FAT32
Capacity: 29.53 GB (31,706,841,088 bytes)
Free space: 29.53 GB (31,706,808,320 bytes)
Cluster size: 32 kilobytes
Volume label: BOOT

Step2

Install OS

link

first download the image file.



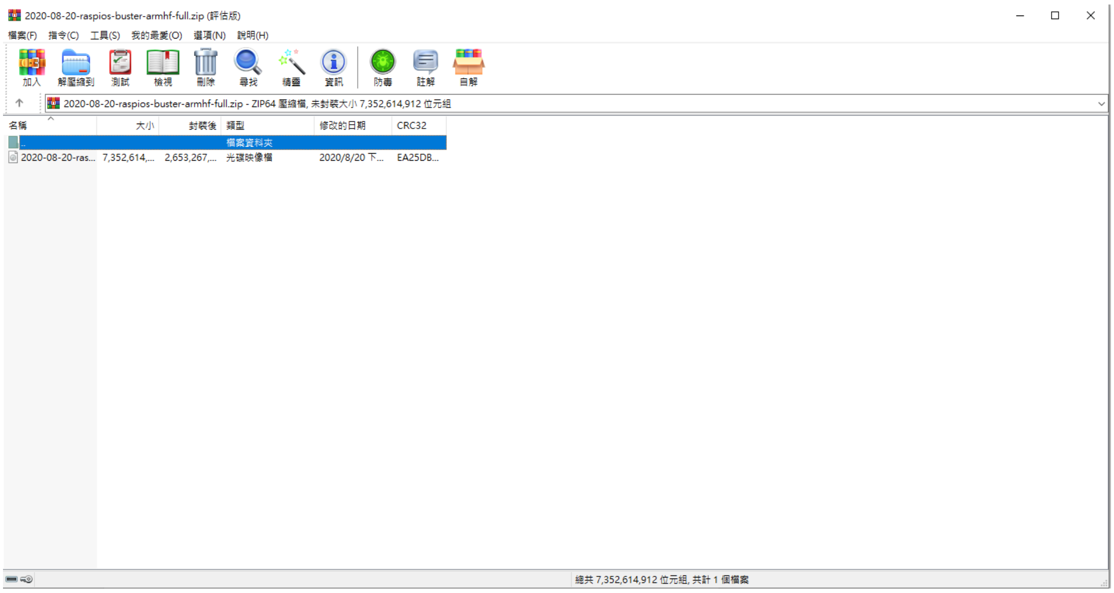
Install **Raspberry Pi Imager** to **Raspberry Pi OS** by running `sudo apt install rpi-imager` in a terminal window

Alternatively, use the links below to download OS images which can be manually copied to an SD card.

Raspberry Pi OS (previously called Raspbian)

NOOBS

Then unzip it.

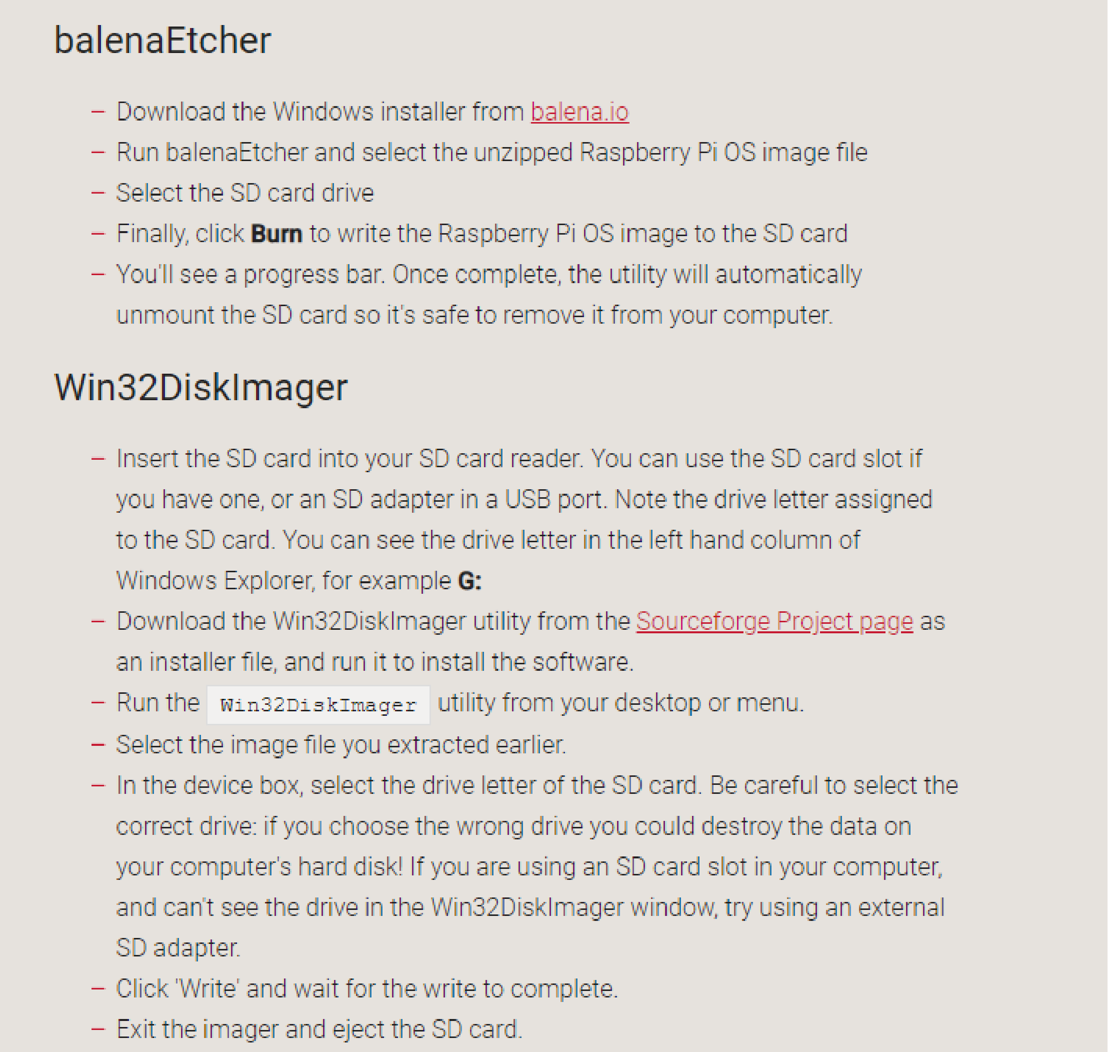


2020-08-20-raspios-buster-armhf-full.zip - ZIP64 壓縮檔, 未封裝大小 7,352,614,912 位元組

名稱	大小	封裝後	類型	修改的日期	CRC32
..			檔案資料夾		
2020-08-20-ras...	7,352,614,...	2,653,267,...	光碟映像檔	2020/8/20 下...	EA25DB...

總共 7,352,614,912 位元組, 共計 1 個檔案

Then download imager which will transfer the image file to your sd card.



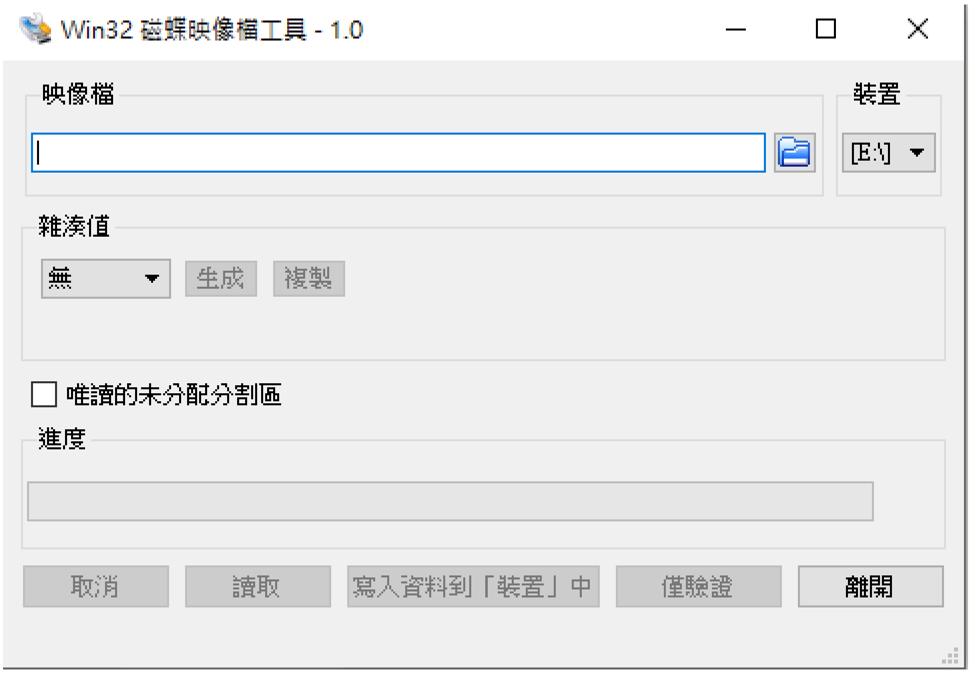
balenaEtcher

- Download the Windows installer from balena.io
- Run balenaEtcher and select the unzipped Raspberry Pi OS image file
- Select the SD card drive
- Finally, click **Burn** to write the Raspberry Pi OS image to the SD card
- You'll see a progress bar. Once complete, the utility will automatically unmount the SD card so it's safe to remove it from your computer.

Win32DiskImager

- Insert the SD card into your SD card reader. You can use the SD card slot if you have one, or an SD adapter in a USB port. Note the drive letter assigned to the SD card. You can see the drive letter in the left hand column of Windows Explorer, for example **G:**
- Download the Win32DiskImager utility from the Sourceforge Project page as an installer file, and run it to install the software.
- Run the `Win32DiskImager` utility from your desktop or menu.
- Select the image file you extracted earlier.
- In the device box, select the drive letter of the SD card. Be careful to select the correct drive: if you choose the wrong drive you could destroy the data on your computer's hard disk! If you are using an SD card slot in your computer, and can't see the drive in the Win32DiskImager window, try using an external SD adapter.
- Click 'Write' and wait for the write to complete.
- Exit the imager and eject the SD card.

After installed it should be like this.



裝置: [E:\]

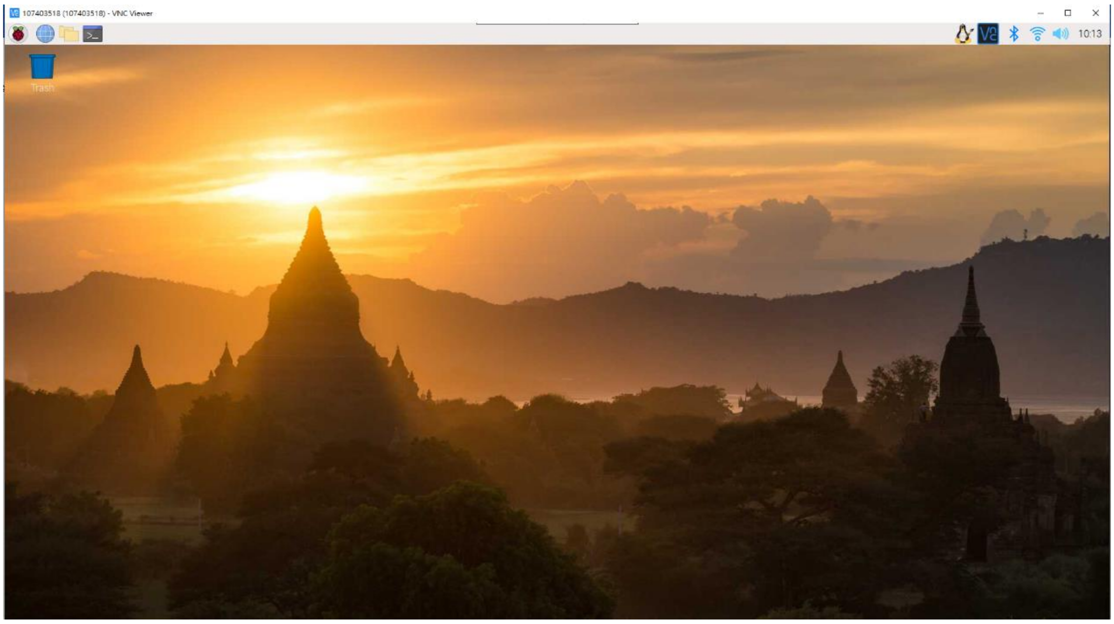
雜湊值: 無

□ 唯讀的未分配分割區

Choose your image file then press 寫入資料到裝置中 button.

After that, take out your sd card and put it into your resberryPi.

Then turn it on, connect it to your screen, and it should show you this:

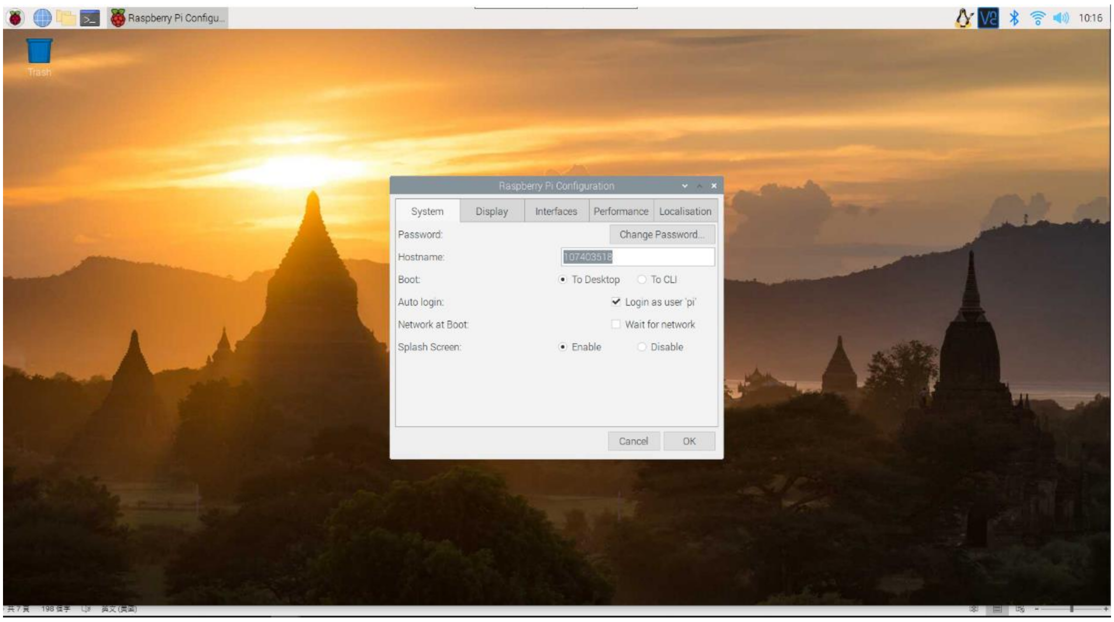


Then you should start to set up your settings.

Country and language should be set up to U.S. English.(in my opinion, you could also use your own language.)

Wifi should at least be connected to one wifi that you can always carry it with you(like your phone).

And change your password and hostname.



Password:

Hostname: 107403518

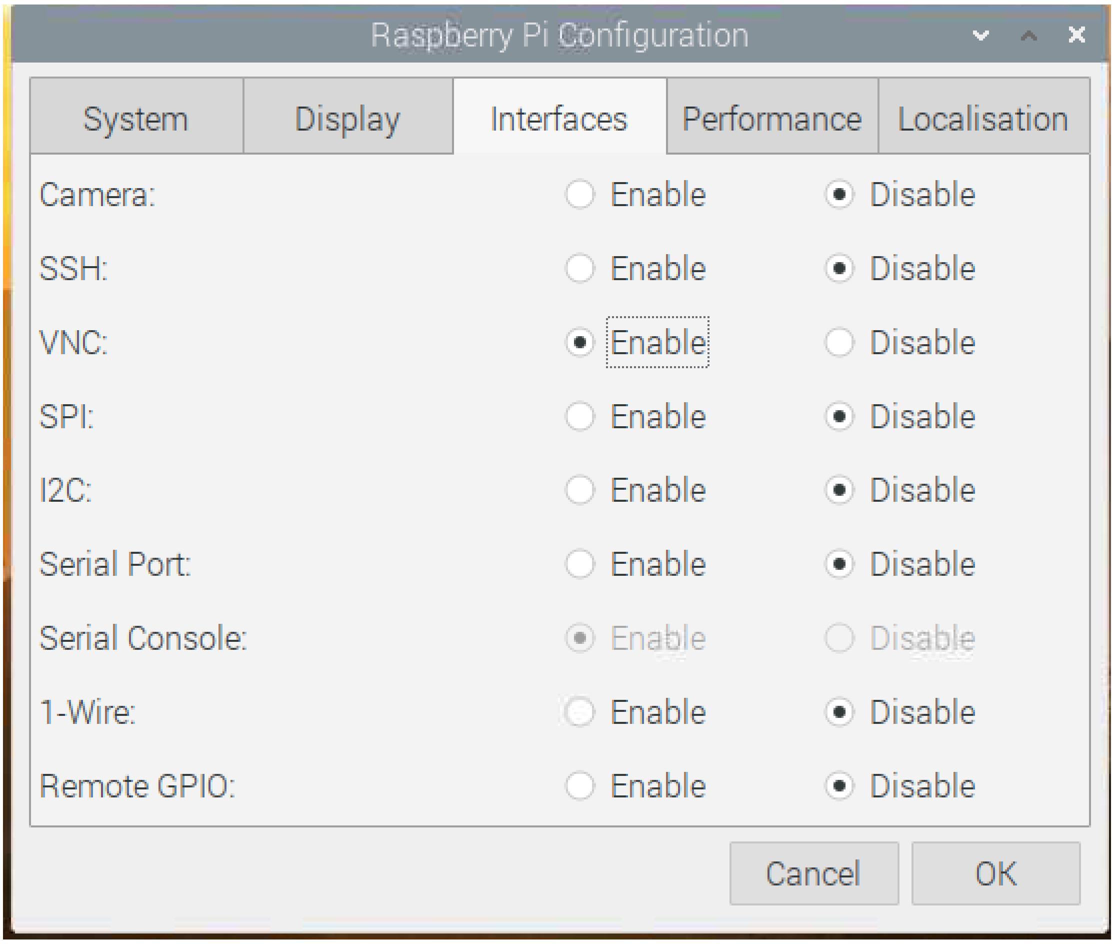
Boot: ● To Desktop ○ To CLI

Auto login: ☑ Login as user 'pi'

Network at Boot: □ Wait for network

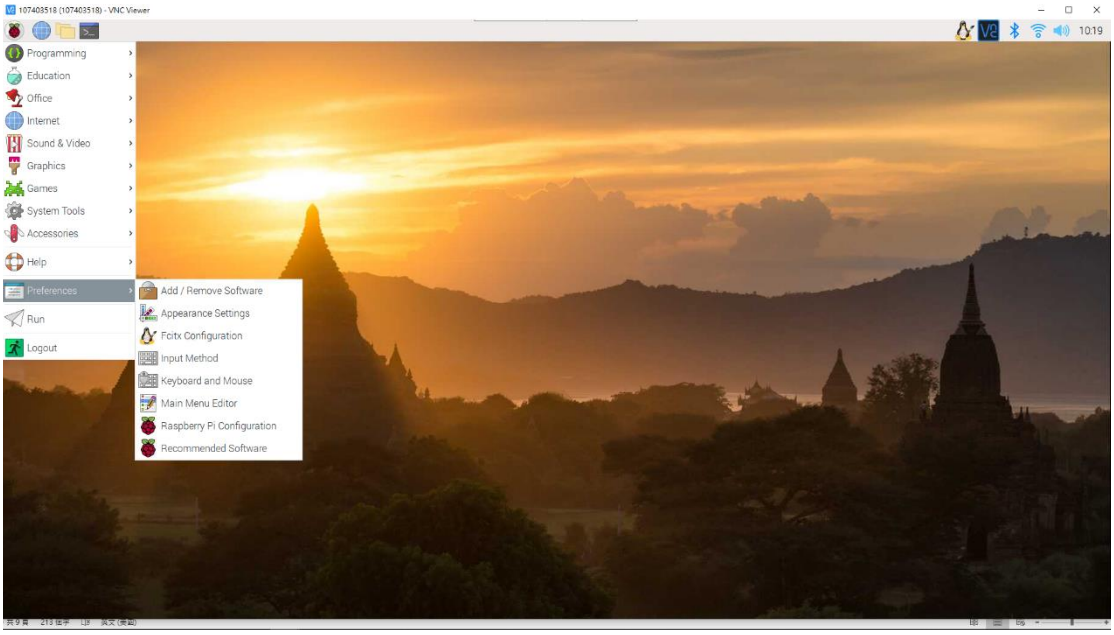
Splash Screen: ● Enable ○ Disable

Then enable your VNC server.



Camera:	○ Enable	● Disable
SSH:	○ Enable	● Disable
VNC:	● Enable	○ Disable
SPI:	○ Enable	● Disable
I2C:	○ Enable	● Disable
Serial Port:	○ Enable	● Disable
Serial Console:	● Enable	○ Disable
1-Wire:	○ Enable	● Disable
Remote GPIO:	○ Enable	● Disable

All this can be set at preference -> respberryPi configuration.

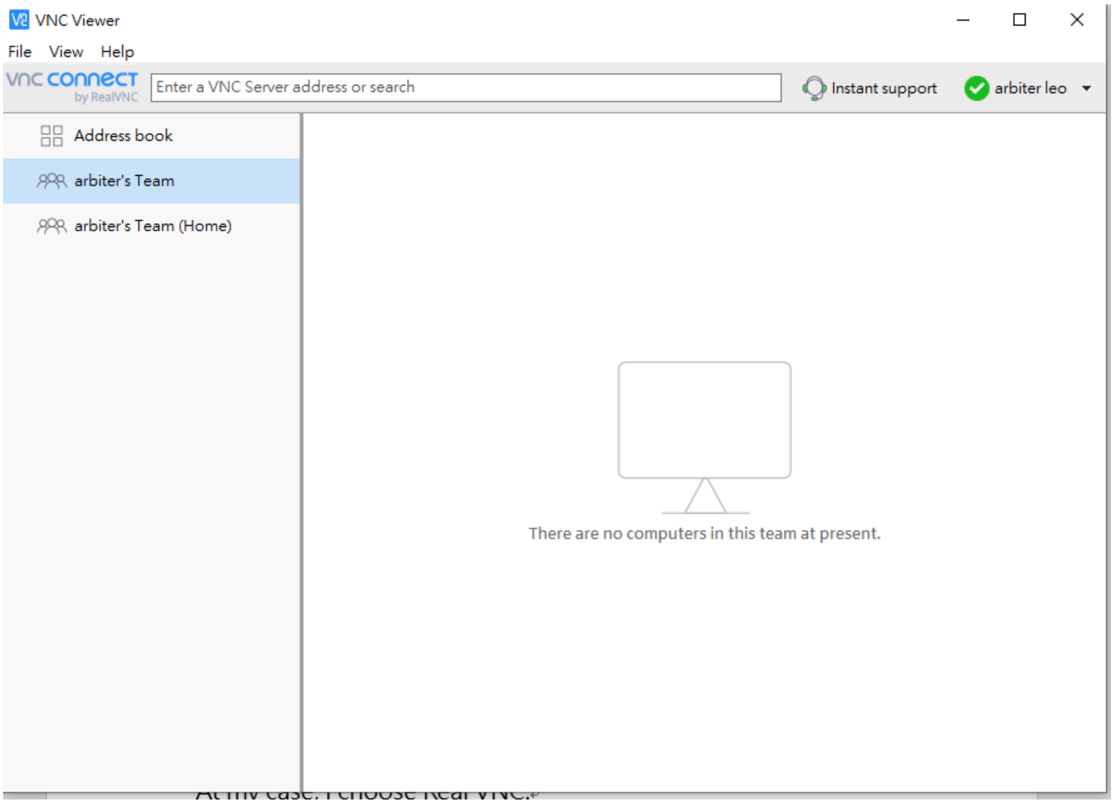


After that, you should download VNC viewer on your own pc.

link

At my case, I choose Real VNC.

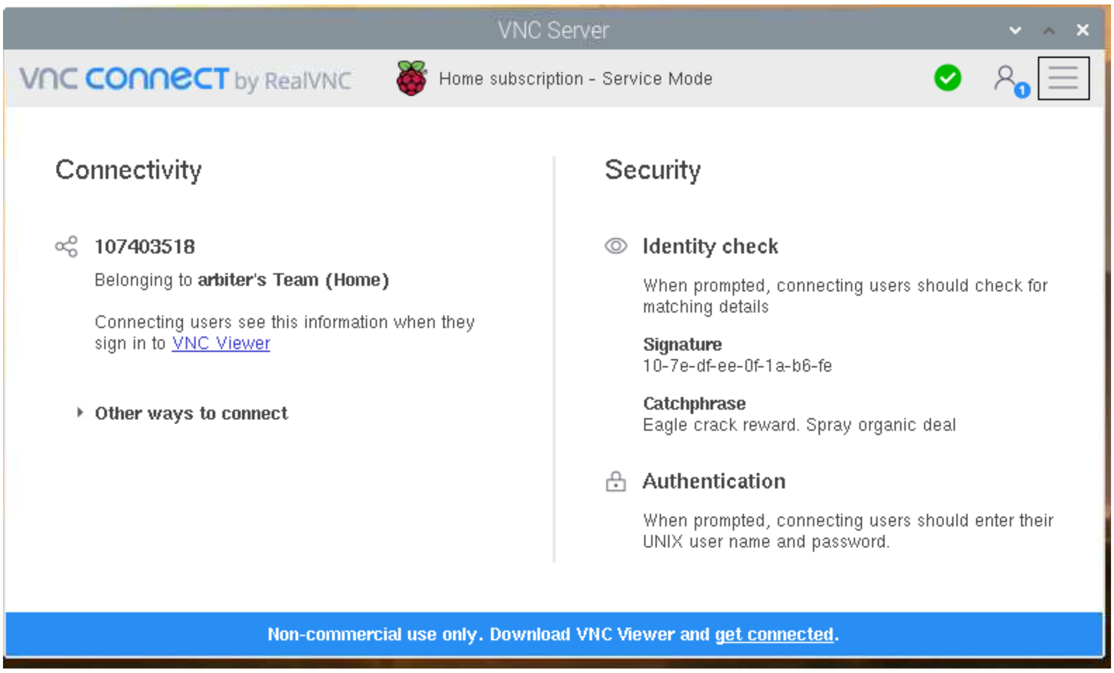
After installed it , you should make a account, log in, like this.



There are no computers in this team at present.

At my case. I choose Real VNC.

Then, go to repberryPi and log in there.



Connectivity

107403518

Belonging to **arbiter's Team (Home)**

Connecting users see this information when they sign in to VNC Viewer

Other ways to connect

Security

Identity check

When prompted, connecting users should check for matching details

Signature
10-7e-df-ee-0f-1a-b6-fe

Catchphrase
Eagle crack reward. Spray organic deal

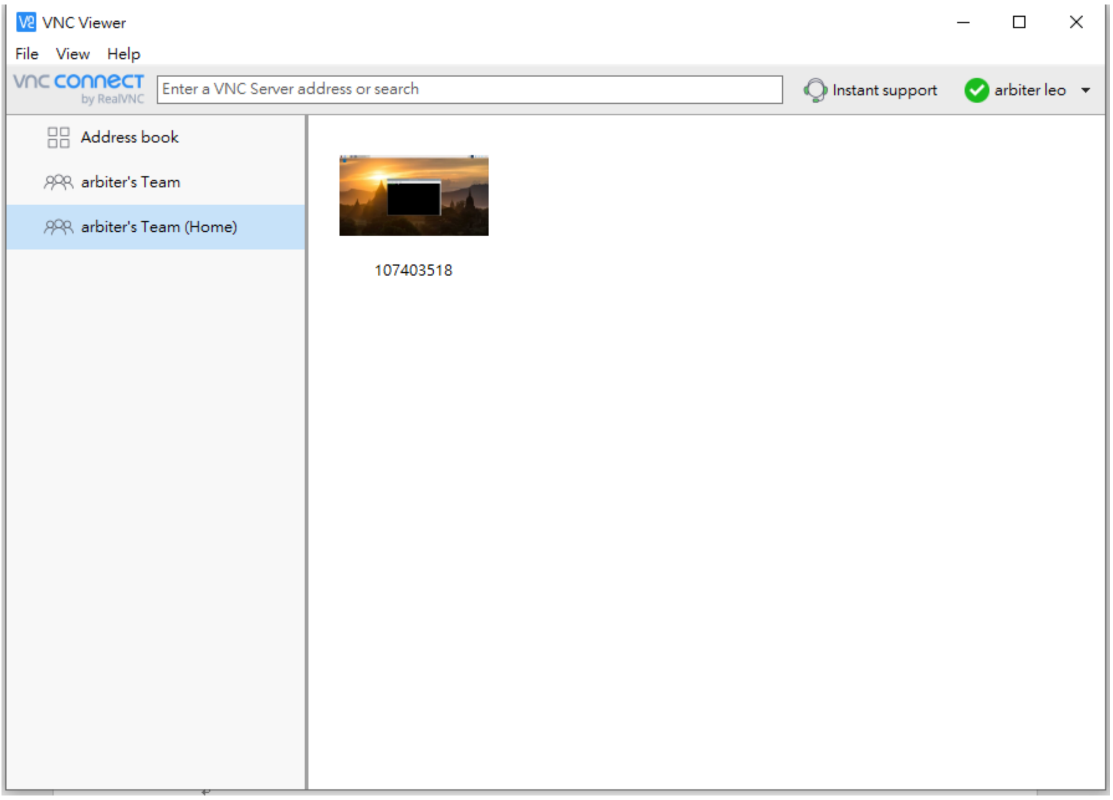
Authentication

When prompted, connecting users should enter their UNIX user name and password.

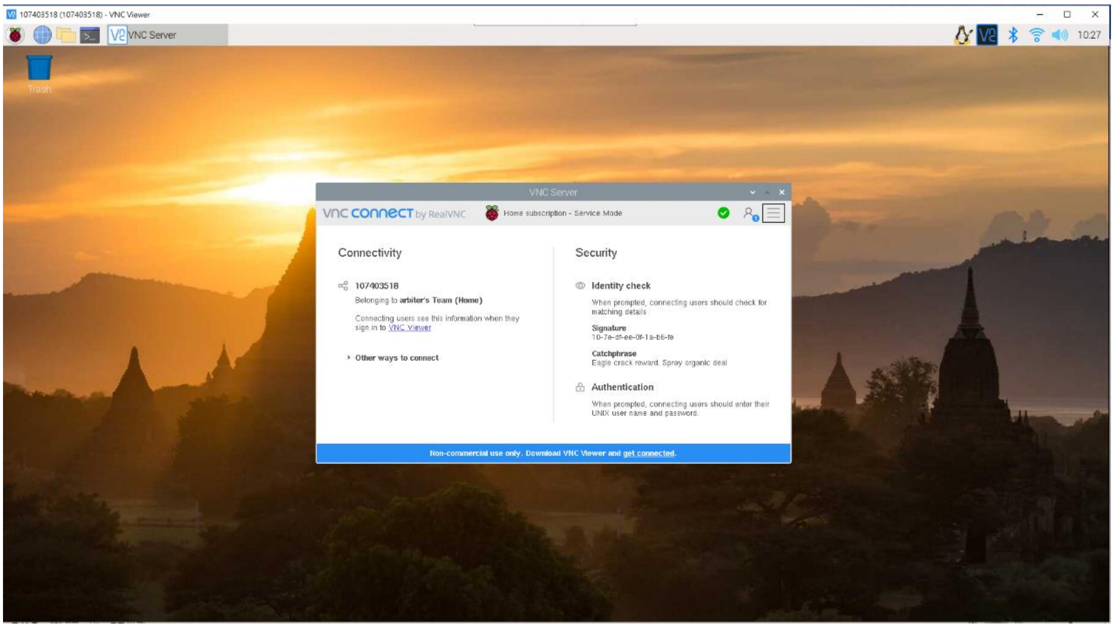
Non-commercial use only. Download VNC Viewer and get connected.

Remember, choose home option when real VNC want you to subscribe, otherwise you will have to pay for it.

After that, you should see respbeeryPi on your VNC viewer.



Select it and connect it, you will have to log in, just enter pi and your own password(you should have changed the password before).



Home subscription - Service Mode

Connectivity

107403518
Belonging to **arbiter's Team (Home)**

Connecting users see this information when they sign in to VNC Viewer

Other ways to connect

Security

Identity check

When prompted, connecting users should check for matching details

Signature
10-7e-df-ee-0f-1a-b6-fe

Catchphrase
Eagle crack reward. Spray organic deal

Authentication

When prompted, connecting users should enter their UNIX user name and password.

Non-commercial use only. Download VNC Viewer and get connected.

Successfully connected.

Now, with the power of our great&free VNC, we could use respberryPi without screen and mouse and keyboard.

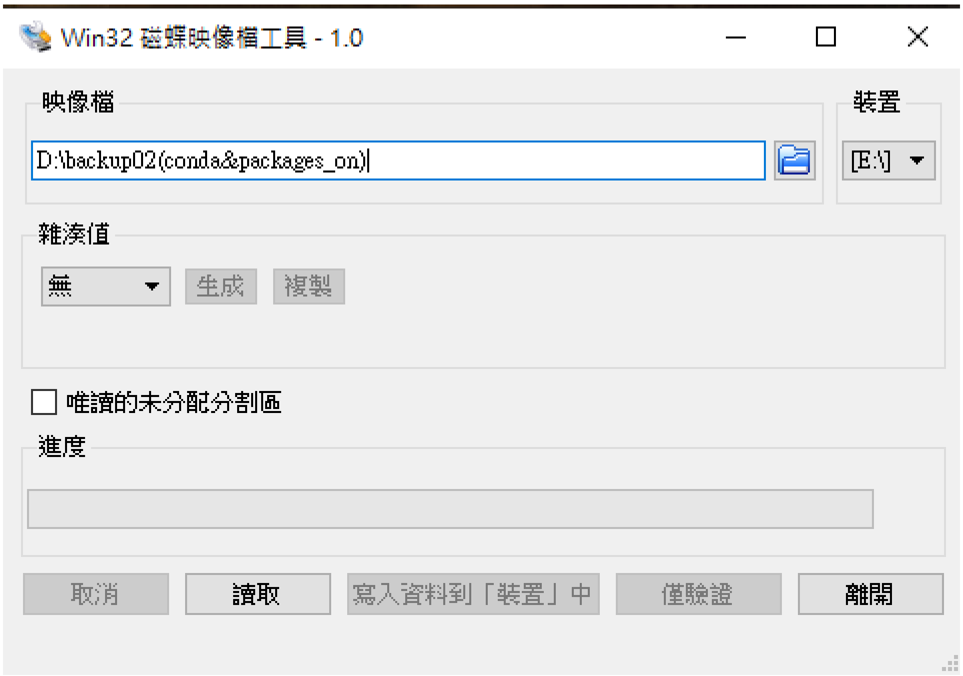
Step3

Back up your sd card.

Open the imager you should have downloaded before.

Put sd card in and enter the name of your backup file.

Then press 讀取 button.



Win32 磁碟映像檔工具 - 1.0

映像檔

D:\backup02(conda&packages_on)

裝置

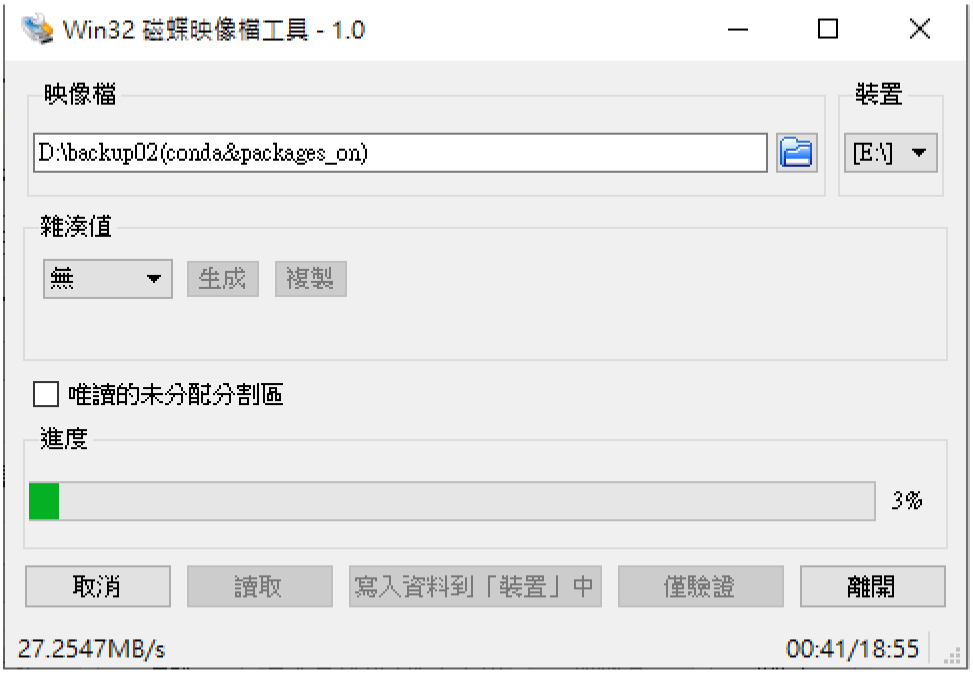
[E:\]

雜湊值

無

□ 唯讀的未分配分割區

進度



Win32 磁碟映像檔工具 - 1.0

映像檔

D:\backup02(conda&packages_on)

裝置

[E:\]

雜湊值

無

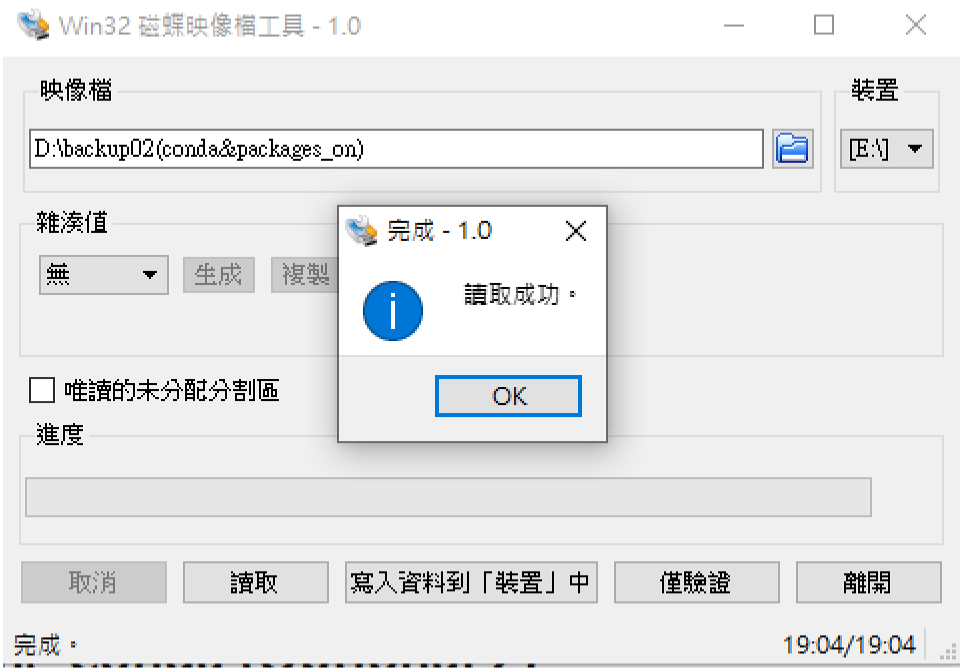
□ 唯讀的未分配分割區

進度

3%

27.2547MB/s

00:41/18:55



Win32 磁碟映像檔工具 - 1.0

映像檔: D:\backup02(conda&packages_on)

裝置: [E:\]

雜湊值: 無

□ 唯讀的未分配分割區

完成 - 1.0

讀取成功。

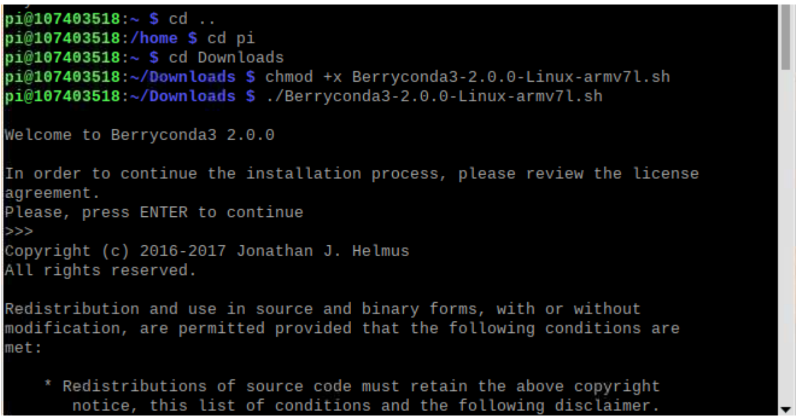
完成。 19:04/19:04

Step4

Install berryconda.

link

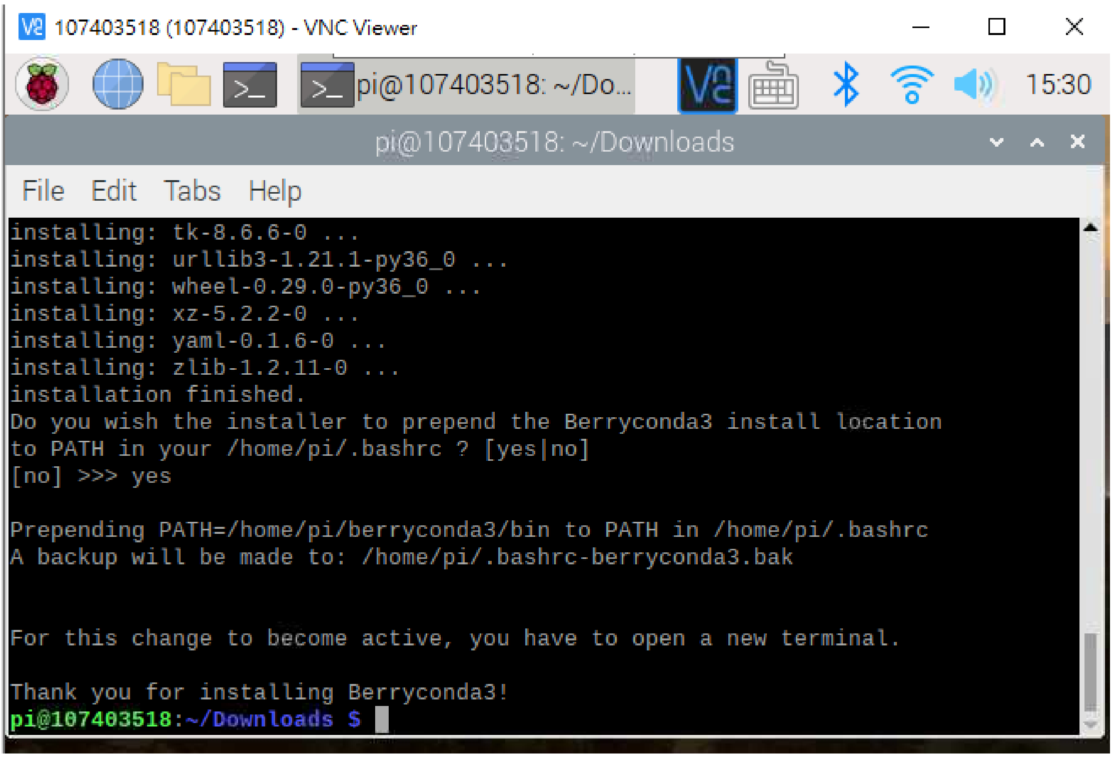
download correct file to your respberriPi, and enter command to your terminal.



```
pi@107403518:~ $ cd ..
pi@107403518:/home $ cd pi
pi@107403518:~ $ cd Downloads
pi@107403518:~/Downloads $ chmod +x Berryconda3-2.0.0-Linux-armv7l.sh
pi@107403518:~/Downloads $ ./Berryconda3-2.0.0-Linux-armv7l.sh

Welcome to Berryconda3 2.0.0

In order to continue the installation process, please review the license
agreement.
Please, press ENTER to continue
>>>
Copyright (c) 2016-2017 Jonathan J. Helmus
All rights reserved.

Redistribution and use in source and binary forms, with or without
modification, are permitted provided that the following conditions are
met:

    * Redistributions of source code must retain the above copyright
      notice, this list of conditions and the following disclaimer.
```

And the download will start, just follow the tips.

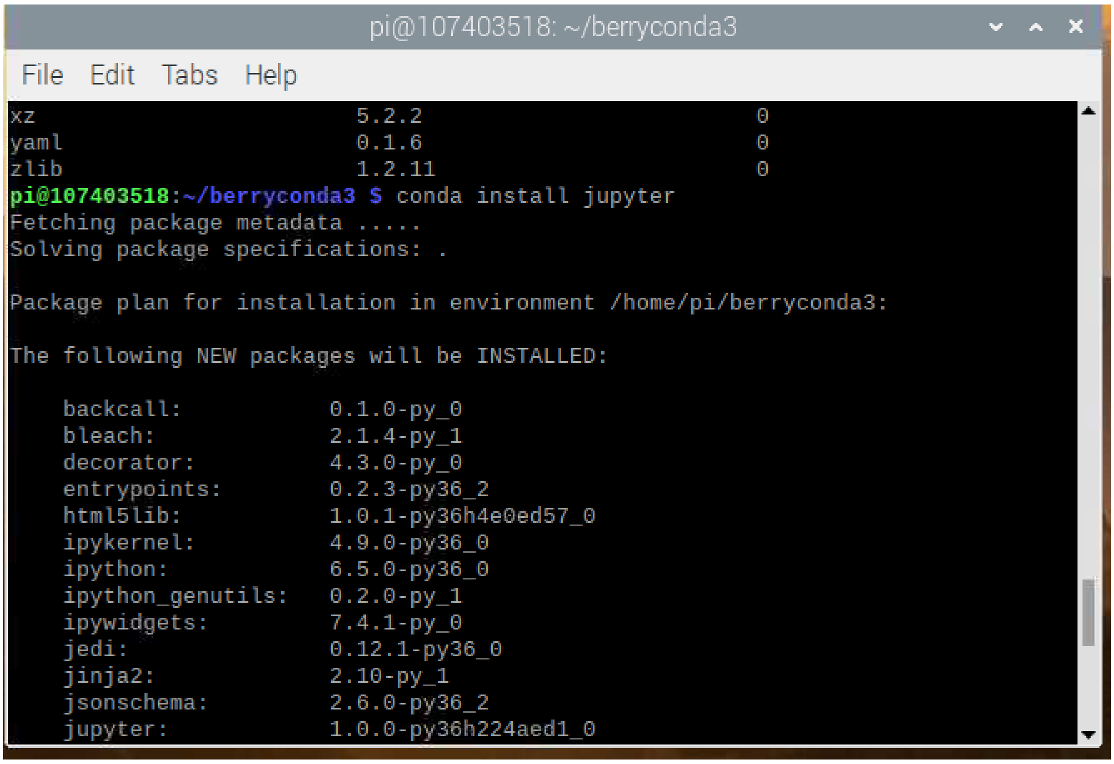
When conda ask you to set up path, choose yes.



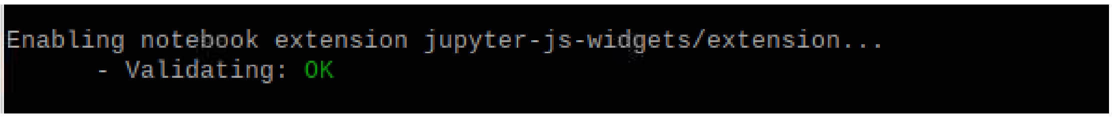
```
installing: tk-8.6.6-0 ...
installing: urllib3-1.21.1-py36_0 ...
installing: wheel-0.29.0-py36_0 ...
installing: xz-5.2.2-0 ...
installing: yaml-0.1.6-0 ...
installing: zlib-1.2.11-0 ...
installation finished.
Do you wish the installer to prepend the Berryconda3 install location
to PATH in your /home/pi/.bashrc ? [yes|no]
[no] >>> yes

Prepending PATH=/home/pi/berryconda3/bin to PATH in /home/pi/.bashrc
A backup will be made to: /home/pi/.bashrc-berryconda3.bak


For this change to become active, you have to open a new terminal.

Thank you for installing Berryconda3!
pi@107403518:~/Downloads $ 
```

Step5

Install jupyter notebook



```
xz                         5.2.2                           0
yaml                       0.1.6                           0
zlib                       1.2.11                          0
pi@107403518:~/berryconda3 $ conda install jupyter
Fetching package metadata .....
Solving package specifications: .

Package plan for installation in environment /home/pi/berryconda3:

The following NEW packages will be INSTALLED:

    backcall:          0.1.0-py_0
    bleach:            2.1.4-py_1
    decorator:         4.3.0-py_0
    entrypoints:       0.2.3-py36_2
    html5lib:          1.0.1-py36h4e0ed57_0
    ipykernel:         4.9.0-py36_0
    ipython:           6.5.0-py36_0
    ipython_genutils:  0.2.0-py_1
    ipywidgets:        7.4.1-py_0
    jedi:              0.12.1-py36_0
    jinja2:            2.10-py_1
    jsonschema:        2.6.0-py36_2
    jupyter:           1.0.0-py36h224aed1_0
```



```
Enabling notebook extension jupyter-js-widgets/extension...
      - Validating: OK
```

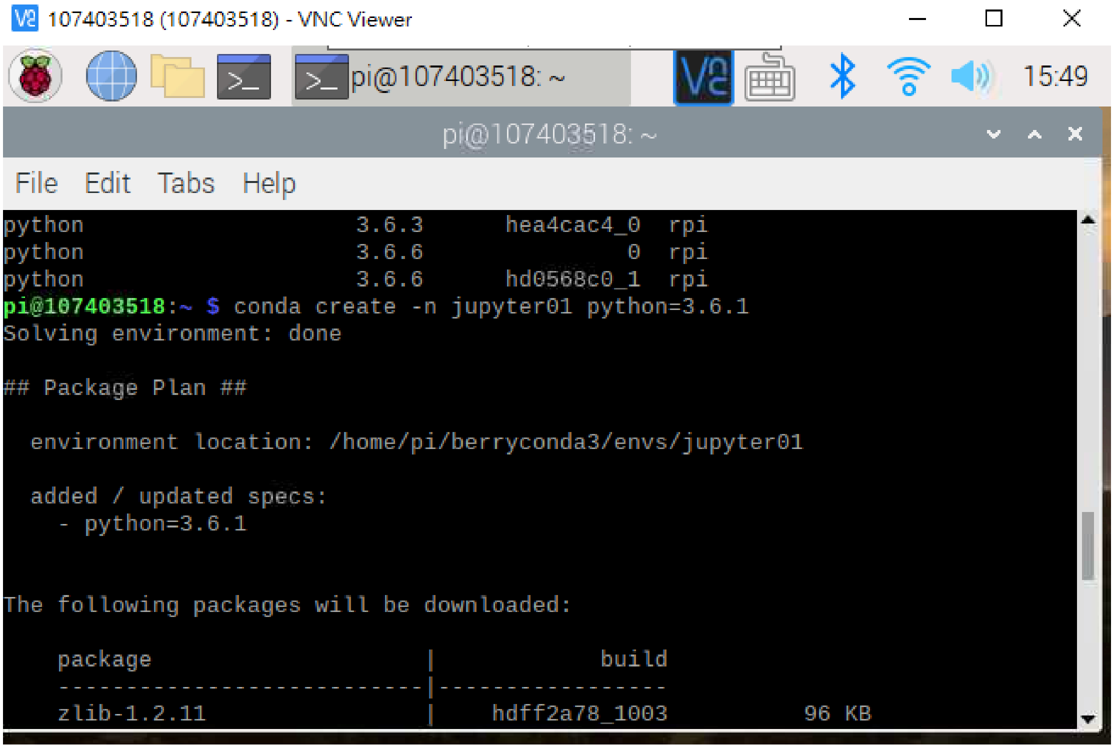
Step6

Set up virtual environment

link

Follow the order of this page.

First check your python version, then update conda.

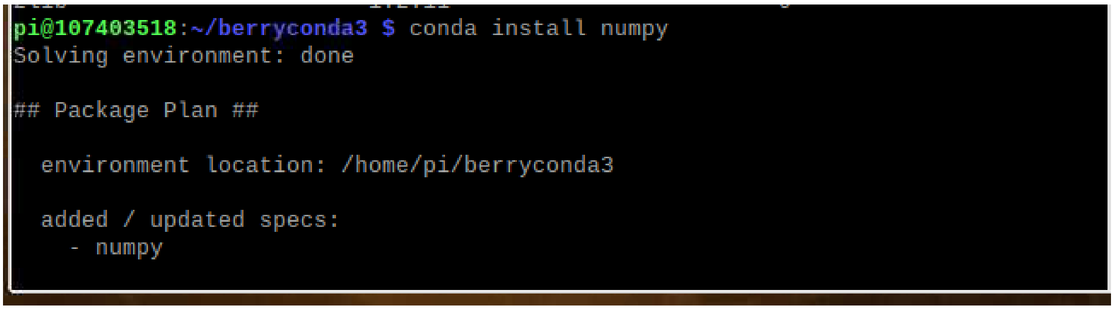


```
python                    3.6.3      hea4cac4_0  rpi
python                    3.6.6               0  rpi
python                    3.6.6      hd0568c0_1  rpi
pi@107403518:~ $ conda create -n jupyter01 python=3.6.1
Solving environment: done

## Package Plan ##

  environment location: /home/pi/berryconda3/envs/jupyter01

  added / updated specs:
    - python=3.6.1


The following packages will be downloaded:

    package                    |            build
    ---------------------------|-----------------
    zlib-1.2.11                |     hdff2a78_1003          96 KB
```

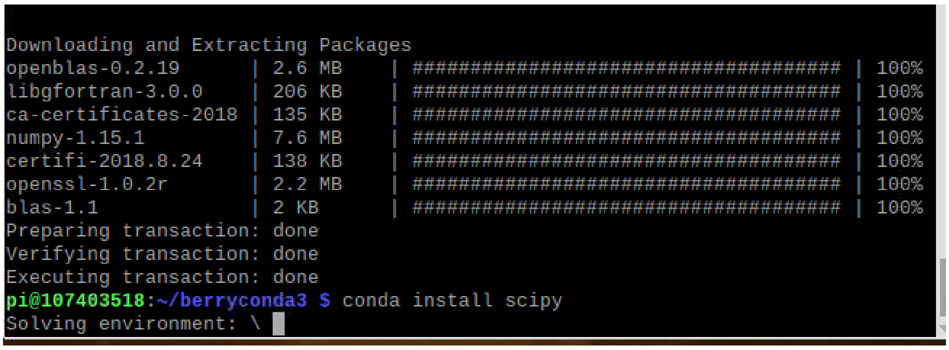
Use conda to create virtual env, enter the name you want to call it and the version of python you want to use.

Step7

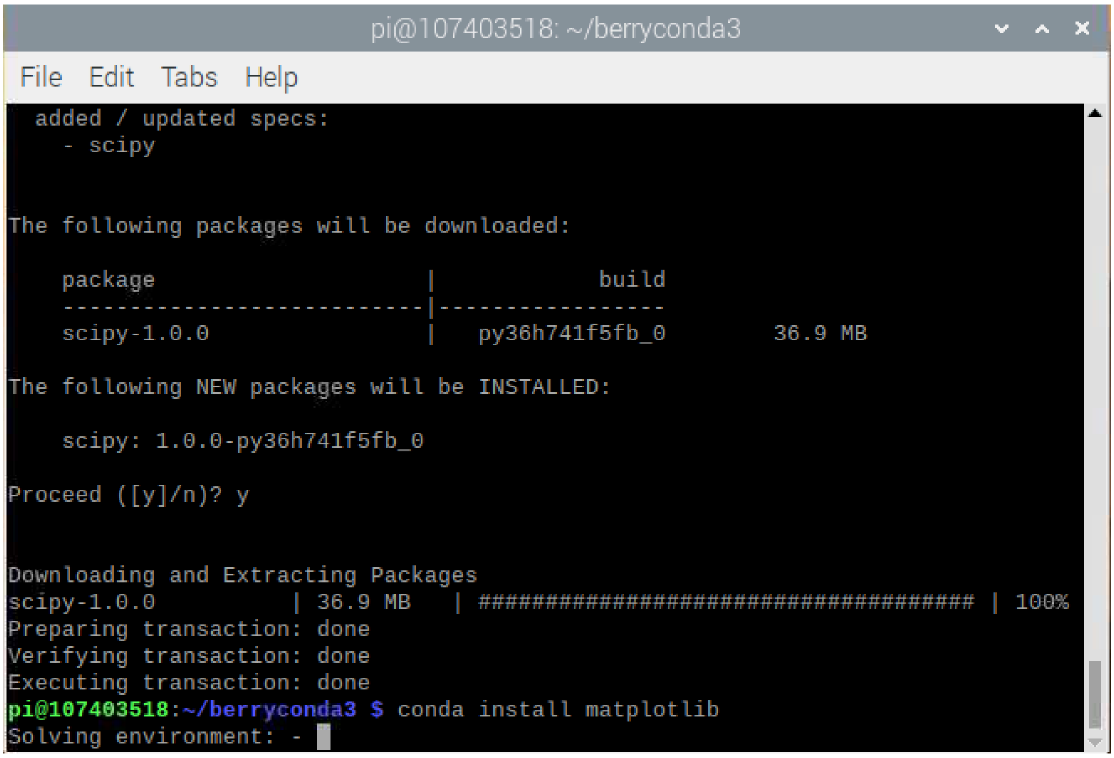
Install other packages to your virtual env.



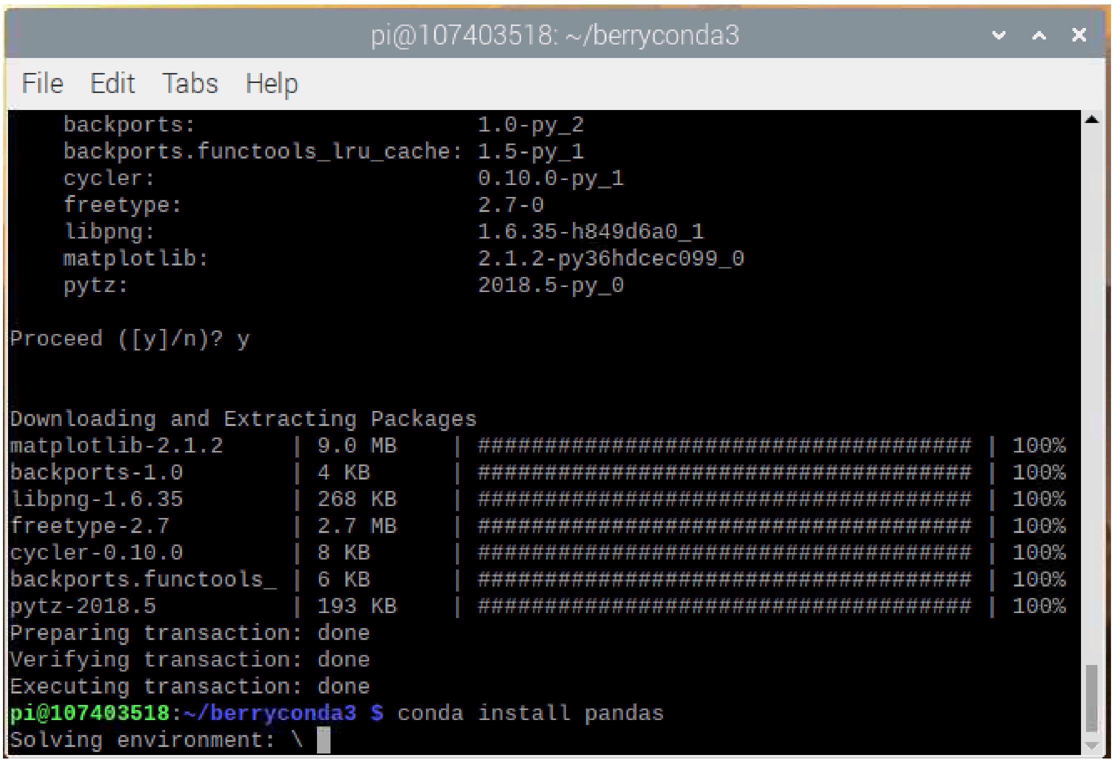
```
pi@107403518:~/berryconda3 $ conda install numpy
Solving environment: done

## Package Plan ##

  environment location: /home/pi/berryconda3

  added / updated specs:
    - numpy
```



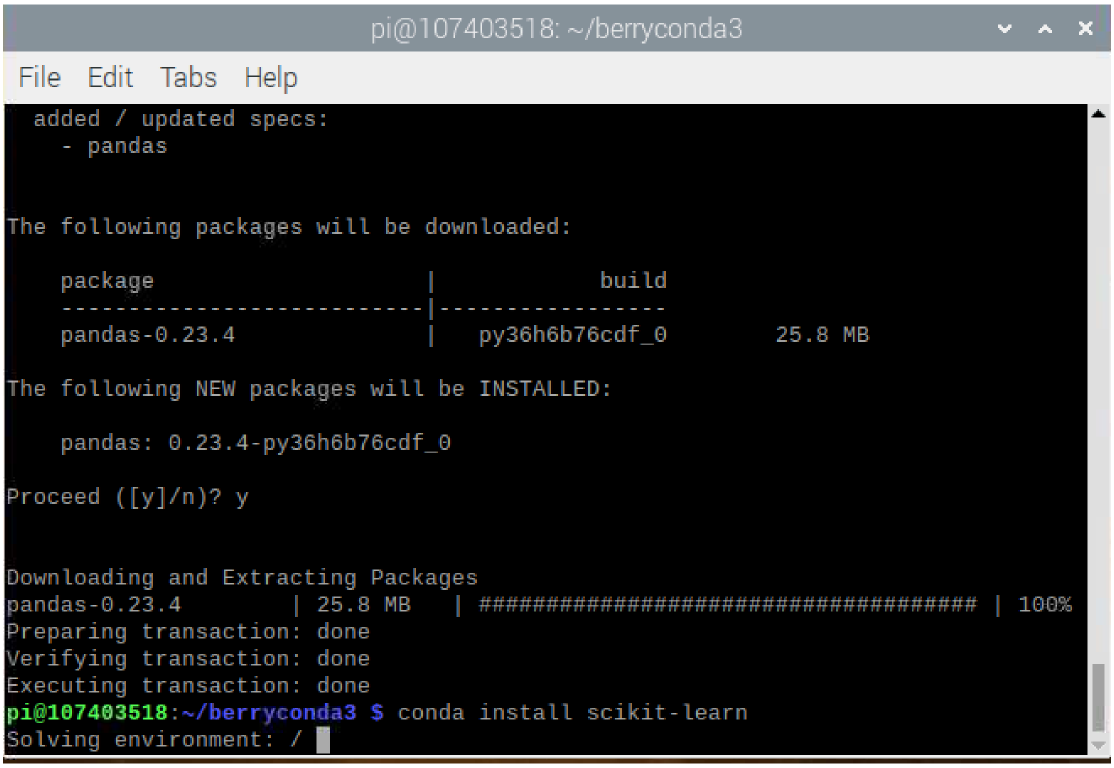
```
Downloading and Extracting Packages
openblas-0.2.19      | 2.6 MB    | ##################################### | 100%
libgfortran-3.0.0    | 206 KB    | ##################################### | 100%
ca-certificates-2018 | 135 KB    | ##################################### | 100%
numpy-1.15.1         | 7.6 MB    | ##################################### | 100%
certifi-2018.8.24    | 138 KB    | ##################################### | 100%
openssl-1.0.2r       | 2.2 MB    | ##################################### | 100%
blas-1.1             | 2 KB      | ##################################### | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
pi@107403518:~/berryconda3 $ conda install scipy
Solving environment: \ 
```



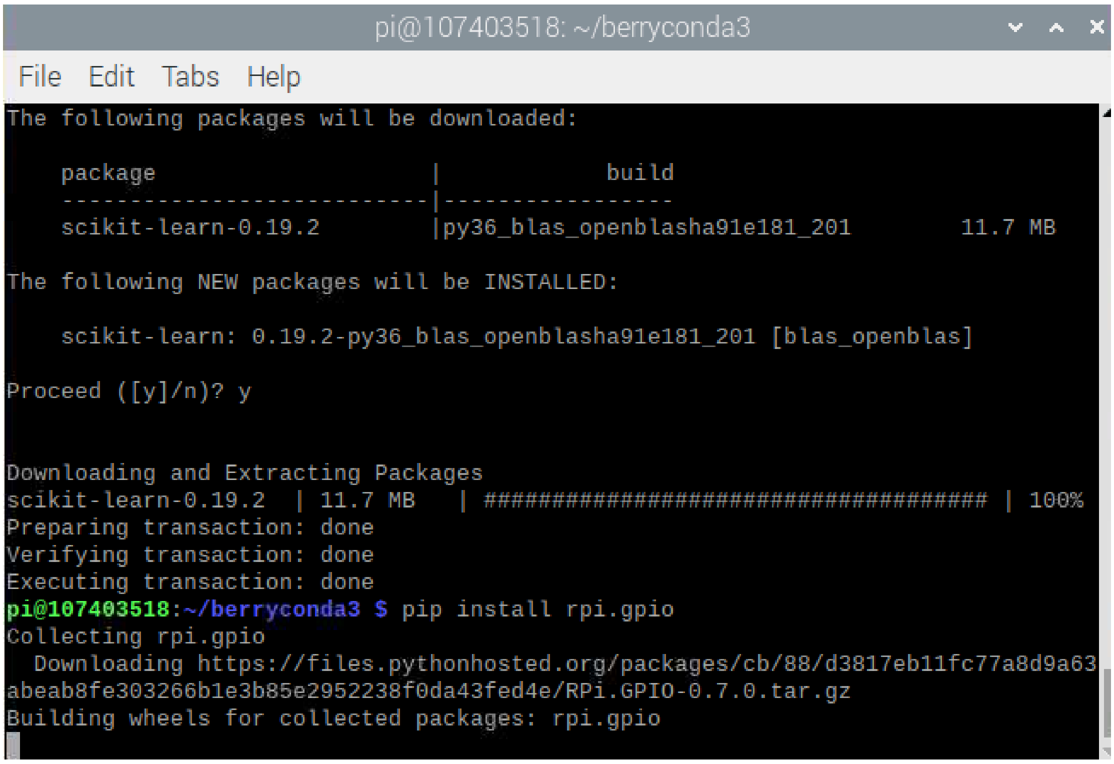
```
  added / updated specs:
    - scipy


The following packages will be downloaded:

    package                    |            build
    ---------------------------|-----------------
    scipy-1.0.0                |   py36h741f5fb_0        36.9 MB

The following NEW packages will be INSTALLED:

    scipy: 1.0.0-py36h741f5fb_0

Proceed ([y]/n)? y


Downloading and Extracting Packages
scipy-1.0.0          | 36.9 MB   | ##################################### | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
pi@107403518:~/berryconda3 $ conda install matplotlib
Solving environment: - 
```



```
    backports:                     1.0-py_2
    backports.functools_lru_cache: 1.5-py_1
    cycler:                        0.10.0-py_1
    freetype:                      2.7-0
    libpng:                        1.6.35-h849d6a0_1
    matplotlib:                    2.1.2-py36hdcec099_0
    pytz:                          2018.5-py_0

Proceed ([y]/n)? y


Downloading and Extracting Packages
matplotlib-2.1.2      | 9.0 MB    | ##################################### | 100%
backports-1.0         | 4 KB      | ##################################### | 100%
libpng-1.6.35         | 268 KB    | ##################################### | 100%
freetype-2.7          | 2.7 MB    | ##################################### | 100%
cycler-0.10.0         | 8 KB      | ##################################### | 100%
backports.functools_  | 6 KB      | ##################################### | 100%
pytz-2018.5           | 193 KB    | ##################################### | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
pi@107403518:~/berryconda3 $ conda install pandas
Solving environment: \
```



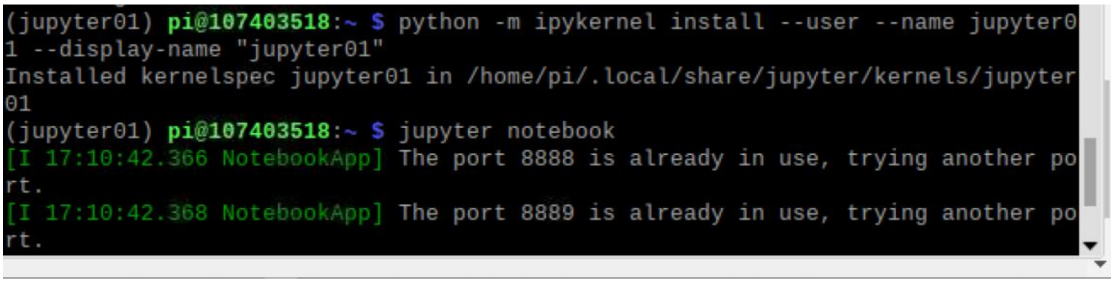
```
  added / updated specs:
    - pandas


The following packages will be downloaded:

    package                    |            build
    ---------------------------|-----------------
    pandas-0.23.4              |   py36h6b76cdf_0        25.8 MB

The following NEW packages will be INSTALLED:

    pandas: 0.23.4-py36h6b76cdf_0

Proceed ([y]/n)? y


Downloading and Extracting Packages
pandas-0.23.4         | 25.8 MB   | ##################################### | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
pi@107403518:~/berryconda3 $ conda install scikit-learn
Solving environment: /
```



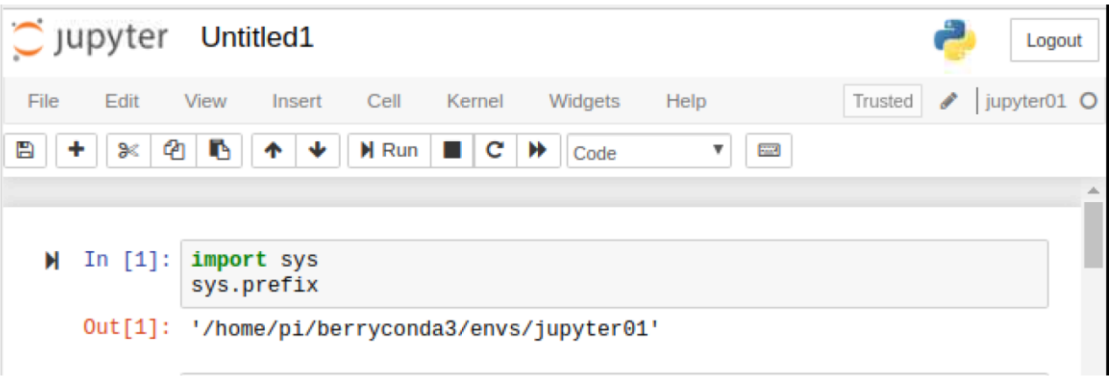
```
The following packages will be downloaded:

    package                    |            build
    ---------------------------|-----------------
    scikit-learn-0.19.2        |py36_blas_openblasha91e181_201        11.7 MB

The following NEW packages will be INSTALLED:

    scikit-learn: 0.19.2-py36_blas_openblasha91e181_201 [blas_openblas]

Proceed ([y]/n)? y


Downloading and Extracting Packages
scikit-learn-0.19.2  | 11.7 MB   | ##################################### | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
pi@107403518:~/berryconda3 $ pip install rpi.gpio
Collecting rpi.gpio
  Downloading https://files.pythonhosted.org/packages/cb/88/d3817eb11fc77a8d9a63
abeab8fe303266b1e3b85e2952238f0da43fed4e/RPi.GPIO-0.7.0.tar.gz
Building wheels for collected packages: rpi.gpio
```

Step8

Make kernel and run in jupyter notebook.

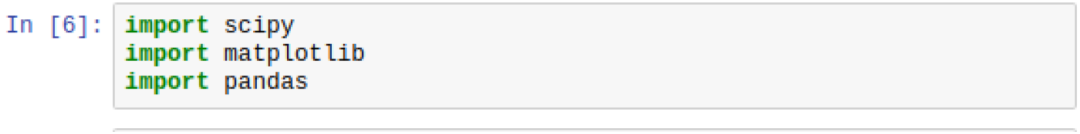


```
(jupyter01) pi@107403518:~ $ python -m ipykernel install --user --name jupyter0
1 --display-name "jupyter01"
Installed kernelspec jupyter01 in /home/pi/.local/share/jupyter/kernels/jupyter
01
(jupyter01) pi@107403518:~ $ jupyter notebook
[I 17:10:42.366 NotebookApp] The port 8888 is already in use, trying another po
rt.
[I 17:10:42.368 NotebookApp] The port 8889 is already in use, trying another po
rt.
```



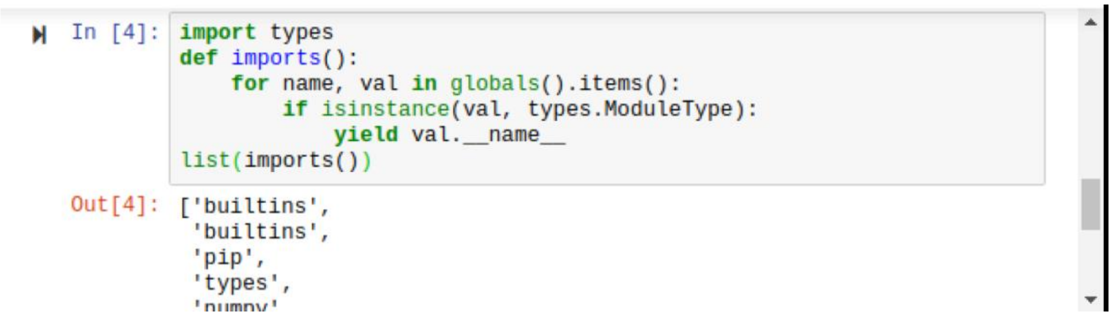
```
In [1]: import sys
        sys.prefix
Out[1]: '/home/pi/berryconda3/envs/jupyter01'
```

Make sure which env you are running at.



```
In [6]: import scipy
        import matplotlib
        import pandas
```

Start importing packages you need.

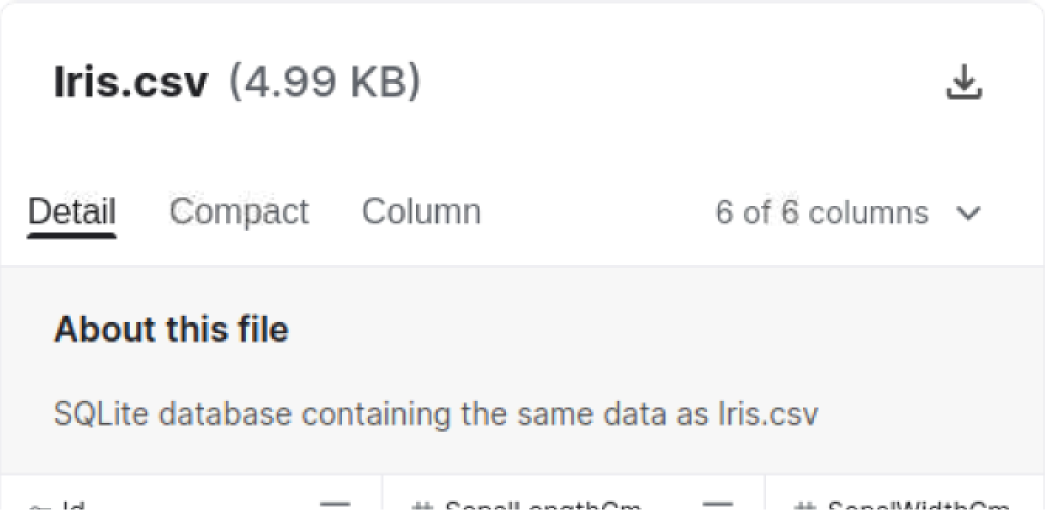


```
In [4]: import types
        def imports():
            for name, val in globals().items():
                if isinstance(val, types.ModuleType):
                    yield val.__name__
        list(imports())

Out[4]: ['builtins',
         'builtins',
         'pip',
         'types',
         'numpy'
```

Run the code to show all the package you have imported.

Step9

Fork a Jupyter Note from Kaggle and run it on your Rpi

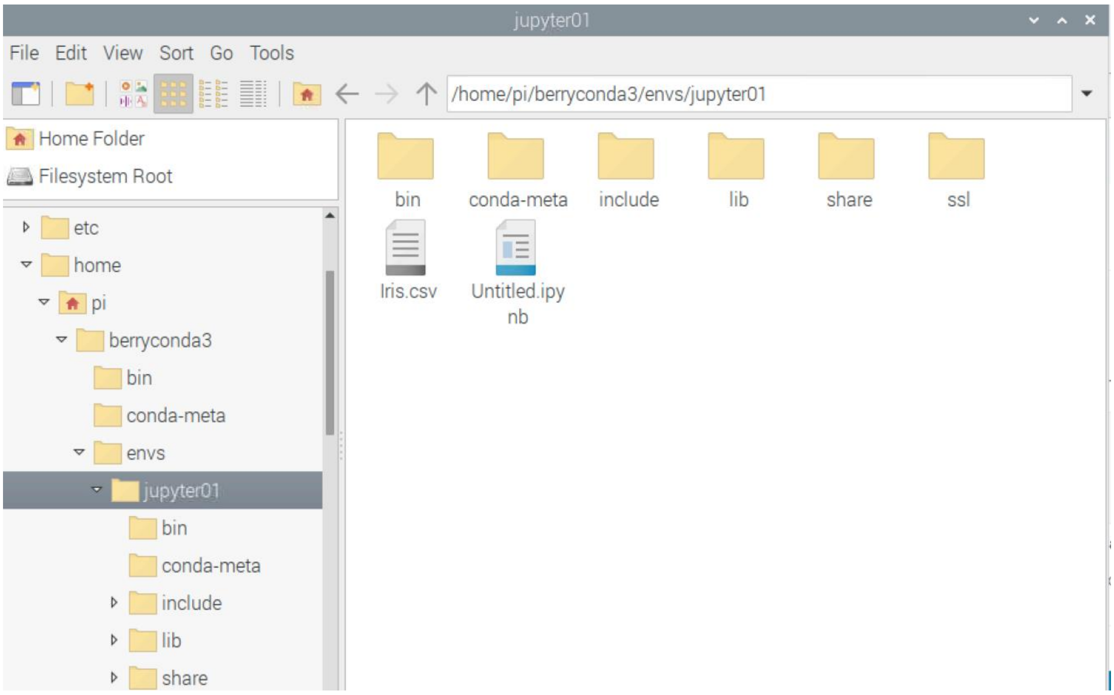


Iris.csv (4.99 KB)

About this file

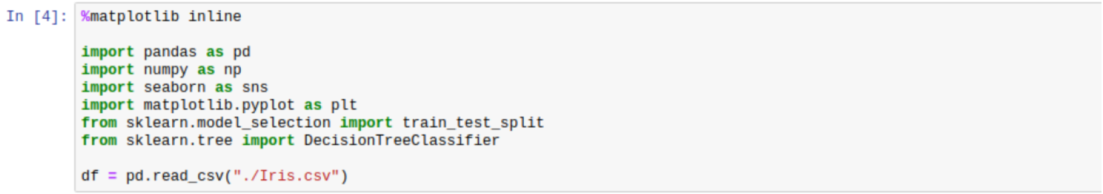
SQLite database containing the same data as Iris.csv

Download the data, and move it to your env folder.

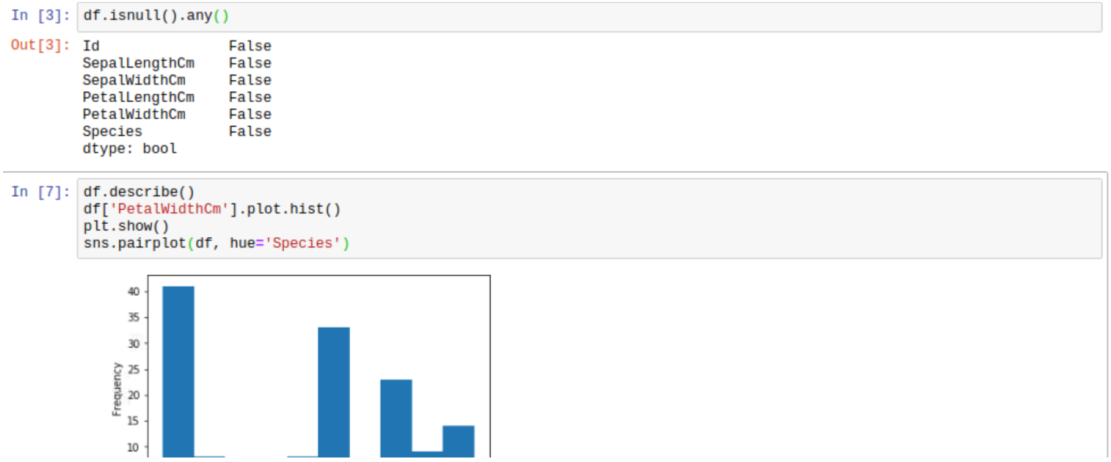


/home/pi/berryconda3/envs/jupyter01

Remember, you should change the path in the code as you move the data into different folder.



```
In [4]: %matplotlib inline

        import pandas as pd
        import numpy as np
        import seaborn as sns
        import matplotlib.pyplot as plt
        from sklearn.model_selection import train_test_split
        from sklearn.tree import DecisionTreeClassifier

        df = pd.read_csv("./Iris.csv")
```



```
In [3]: df.isnull().any()

Out[3]: Id               False
        SepalLengthCm    False
        SepalWidthCm     False
        PetalLengthCm    False
        PetalWidthCm     False
        Species          False
        dtype: bool

In [7]: df.describe()
        df['PetalWidthCm'].plot.hist()
        plt.show()
        sns.pairplot(df, hue='Species')
```