Step-by-step instructions for practices 1 & 2

*** Instructions ***

- **Please note there are 2 pages in this document.**
- **You are encouraged to refer to the official Raspberry Pi documentation (available at https://www.raspberrypi.org/documentation/) and other online materials.**

  - The steps are listed below:

1. Formatting the SD card:

- You would need a SD card formatter - https://www.sdcard.org/downloads/formatter/

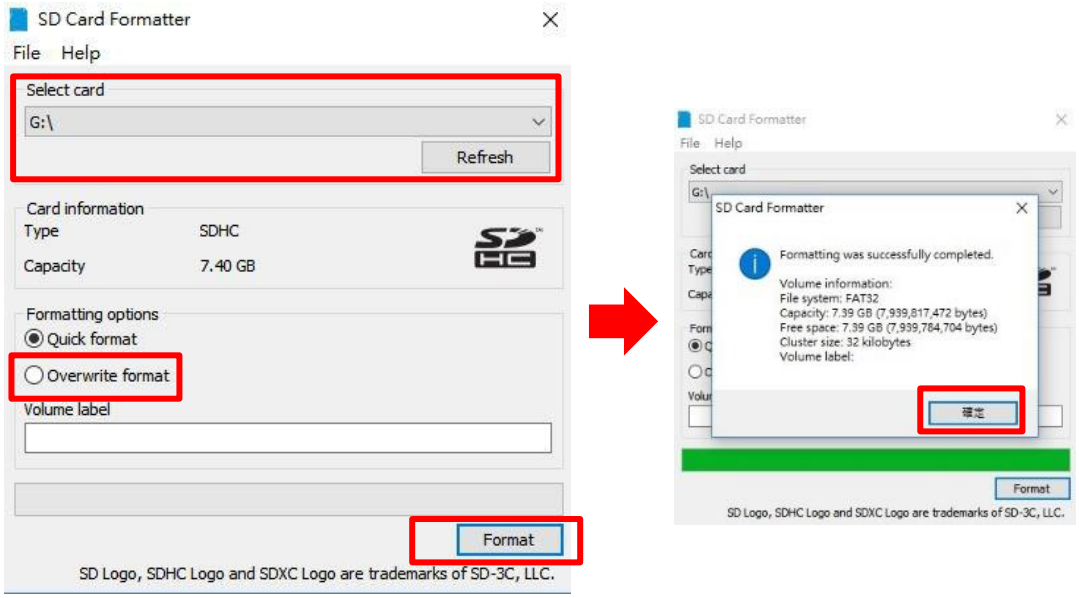
Move to the bottom of website and download the different version SD Memory Card Formatter according to your OS.

And click Accept.

After installation You can see Setup.exe.

After setup you can see this/

Select which SD card you want to format and chose overwrite format then click format.



2. Installing operating system images:

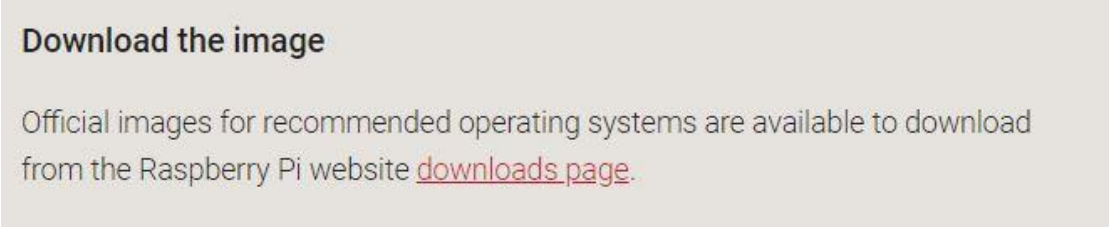
- First go here>>https://www.raspberrypi.org/documentation/installation/installing-images/README.md

  You need to download 7-zip

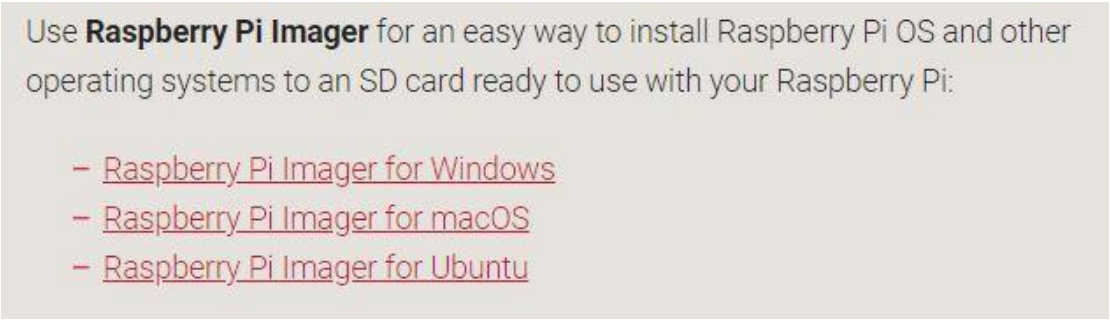
Note: the Raspberry Pi OS with desktop image contained in the ZIP archive is over 4GB in size and uses the ZIP64 format. To uncompress the archive, a unzip tool that supports ZIP64 is required. The following zip tools support ZIP64:

- 7-Zip (Windows)
- The Unarchiver (Mac)
- Unzip (Linux)

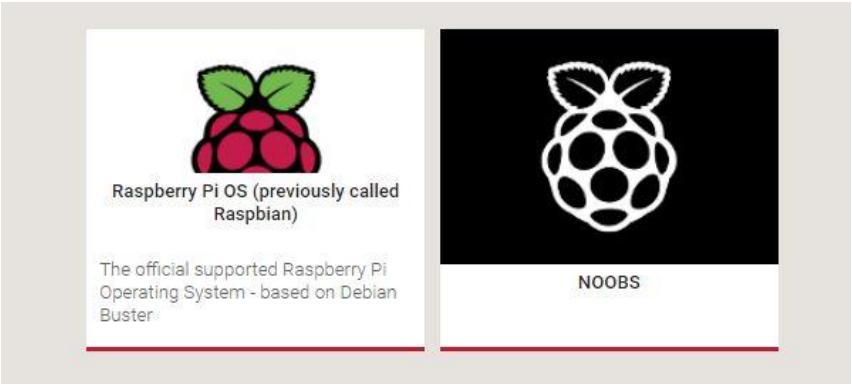
And download the image.



Download imager for install Raspberry pi OS.



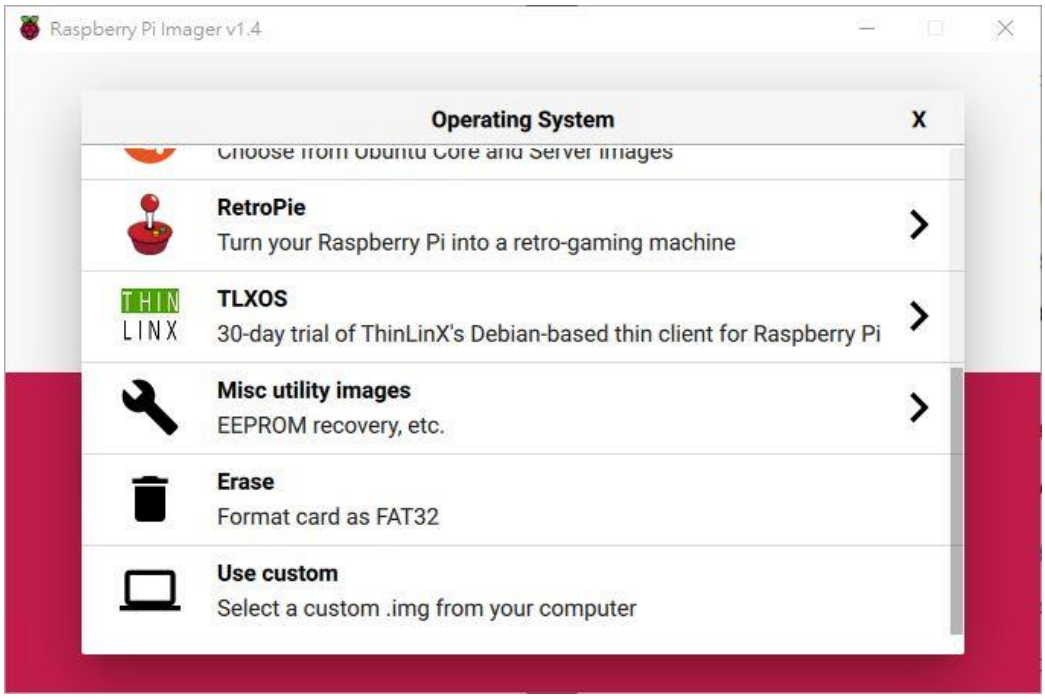
choose one to download.



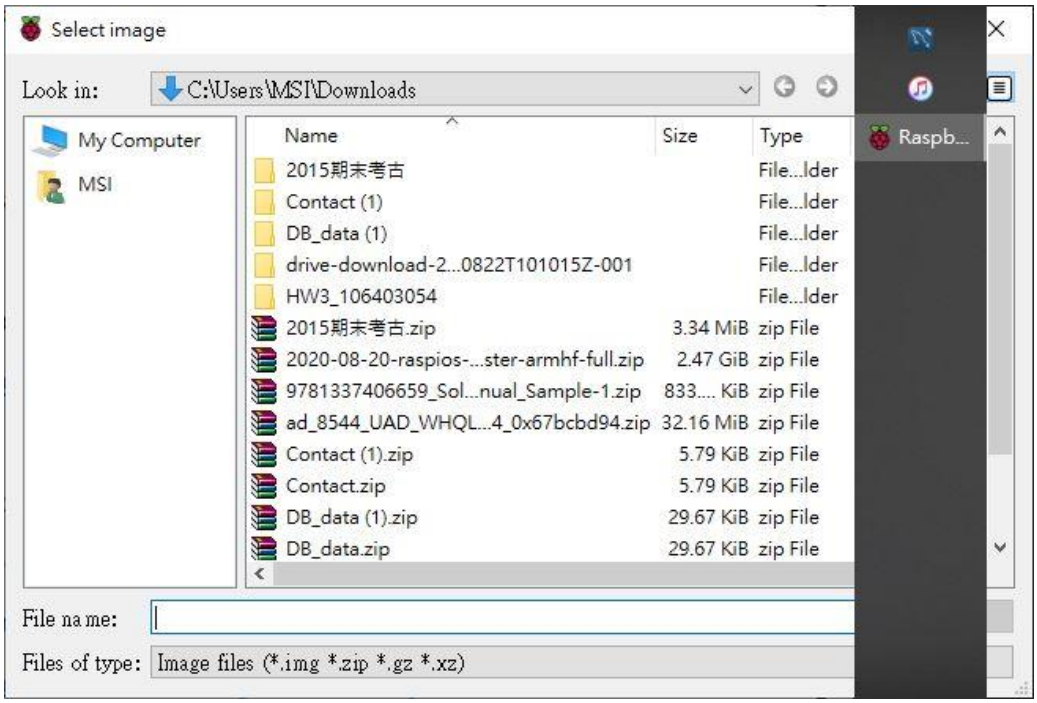
Run the Raspberry pi imager. Choose OS(the image you downloaded)

and choose SD card.

Click use custom.



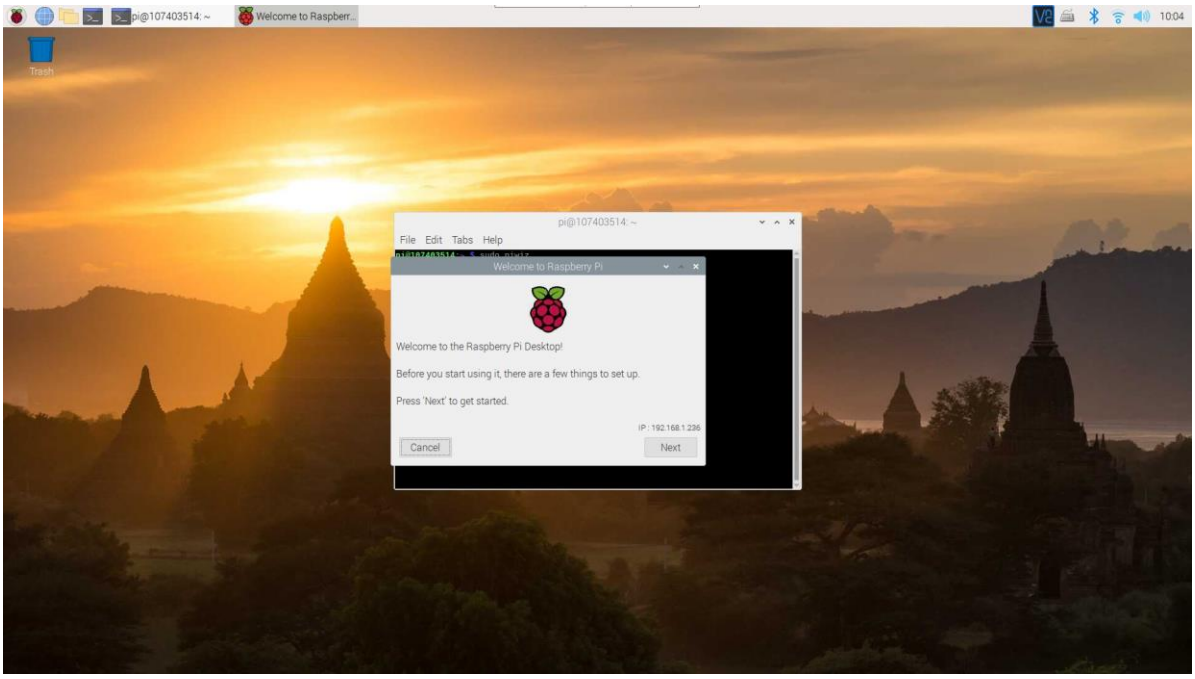
Select the image and then start installation.



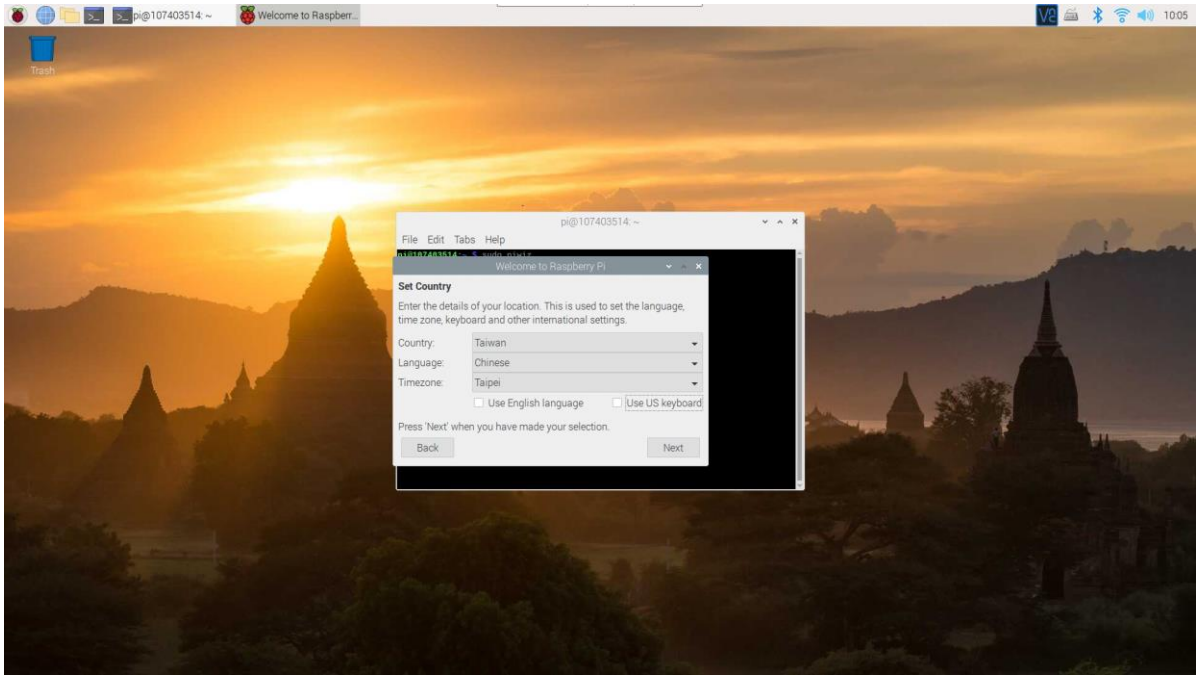
3. **Booting up your Raspberry Pi for the first time:**

Insert SD card to Raspberry Pi. You can see this.

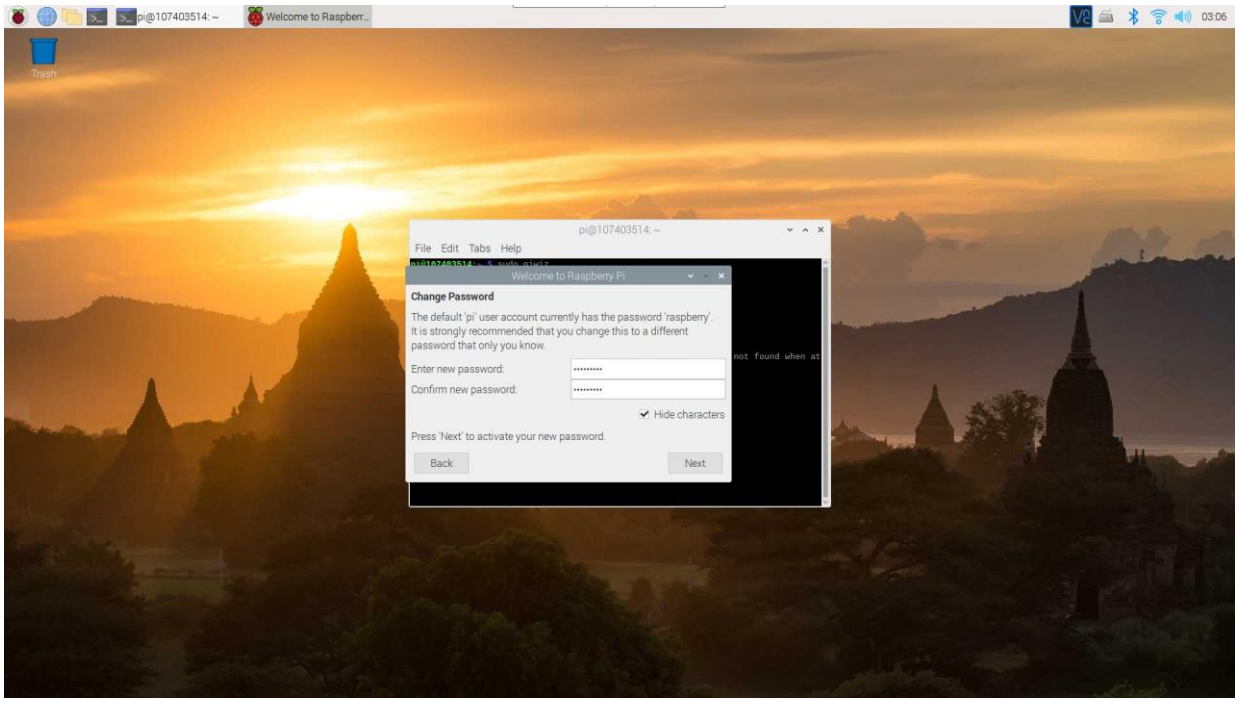
Click next.



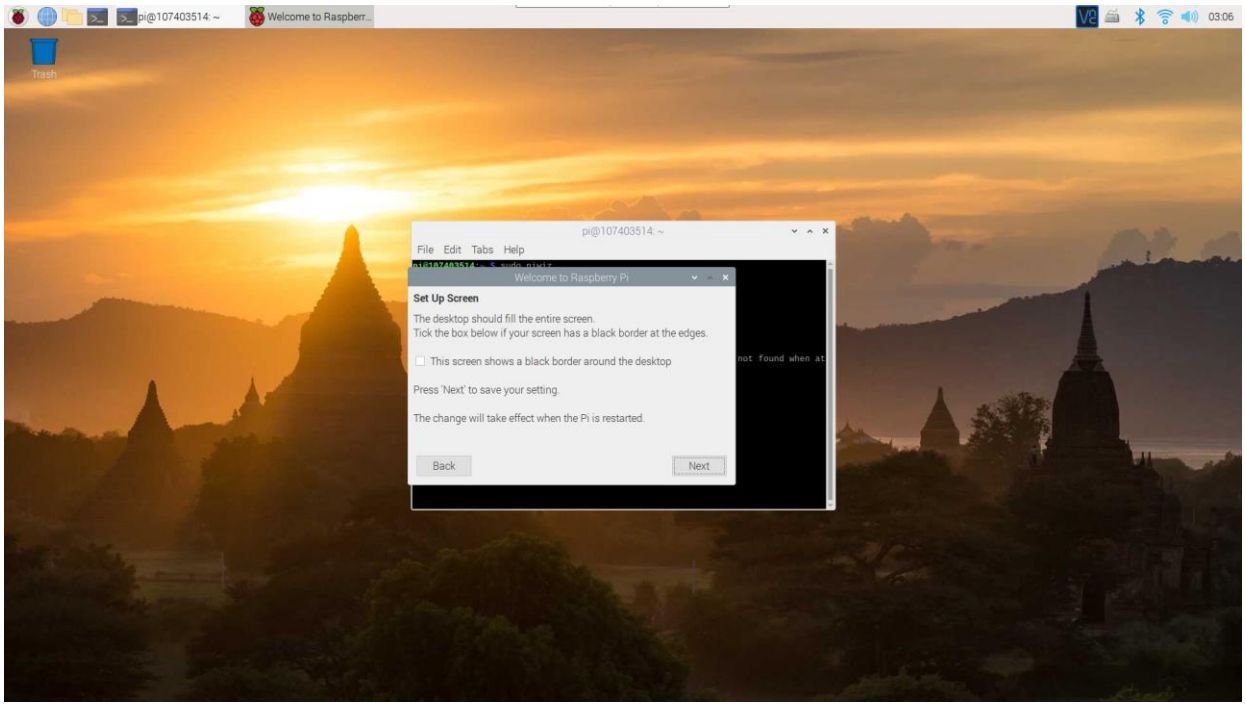
Set country, language and timezone.



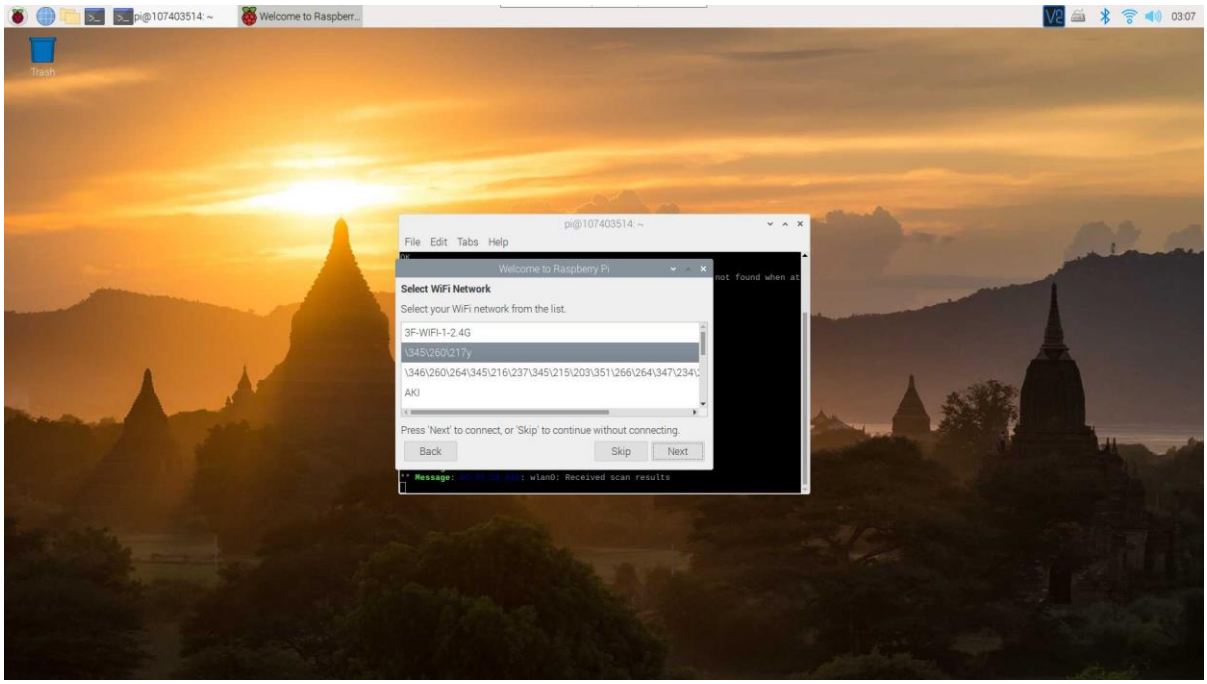
Set the new password for preset user pi.



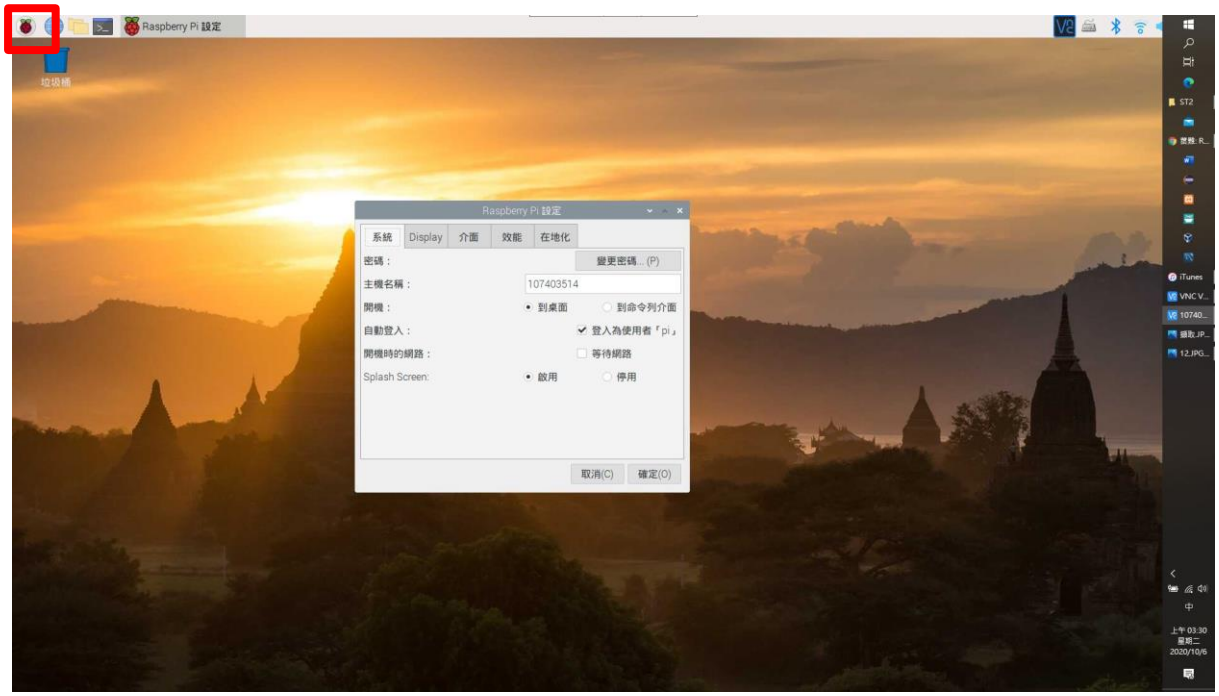
And adjust the display mode.

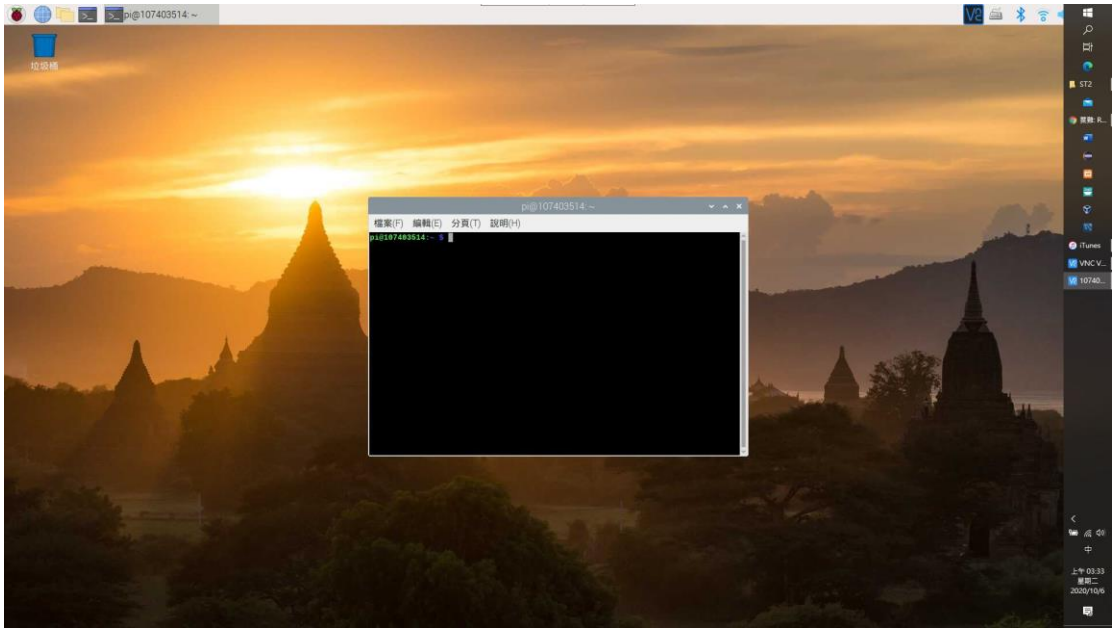


Connect to WIFI.



Go to Raspberry set up and reset the hostname to your student ID.

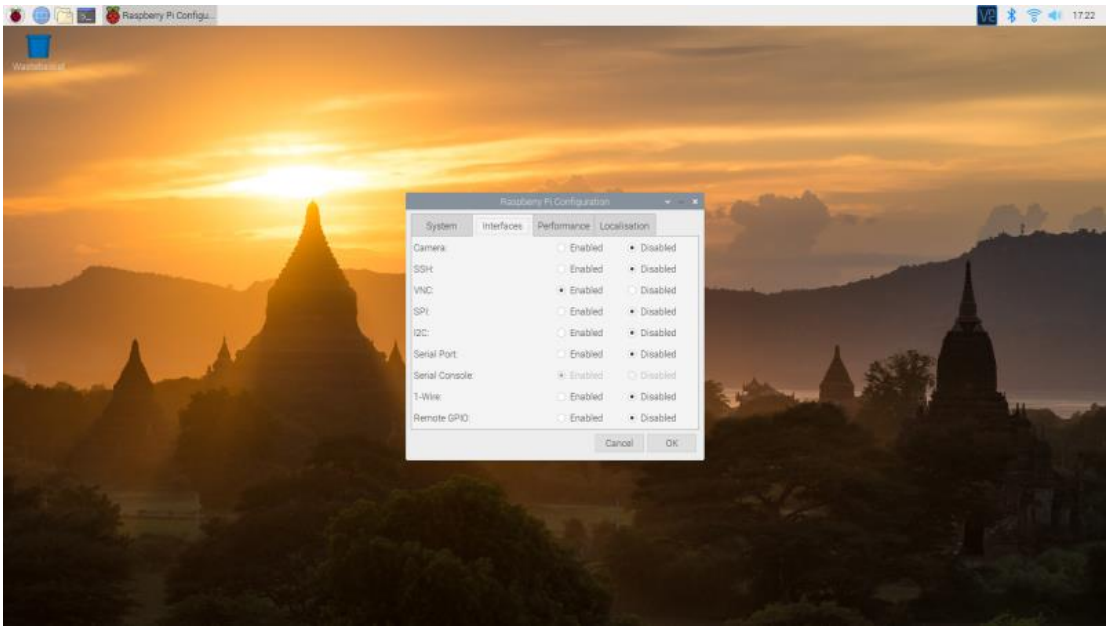




4. **VNC**

- **First make sure your computer and Raspberry connect to the same internet.**

Enable the use of VNC.

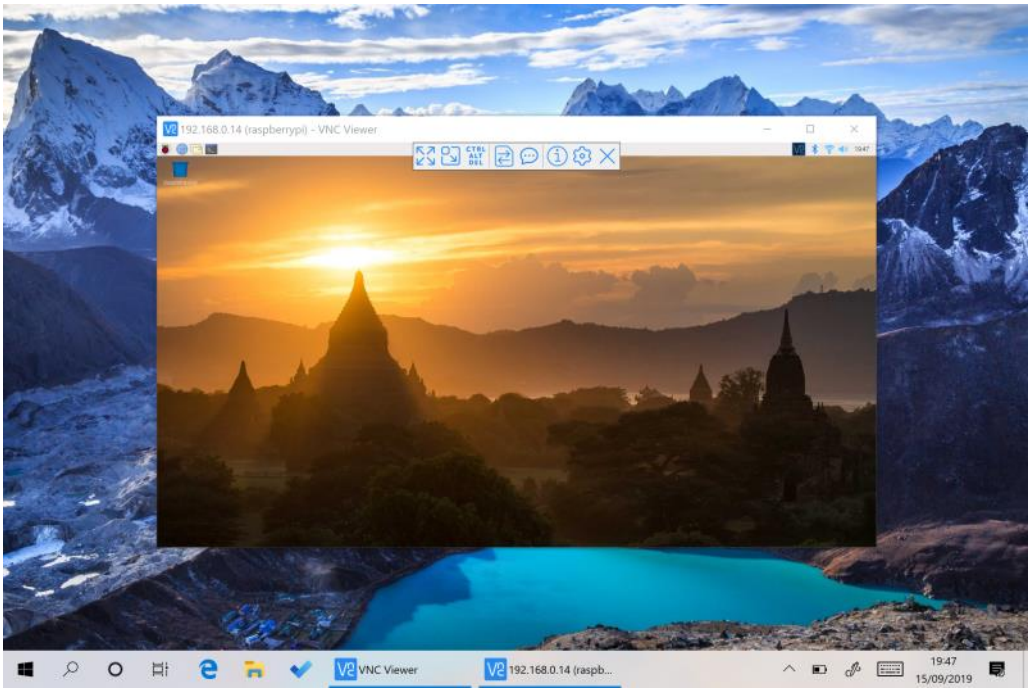


And use your computer download VNC - https://www.realvnc.com/en/connect/download/viewer/

Then enter your Raspberry Pi IP on VNC Viewer.

Enter the password of your username.

And you can see –



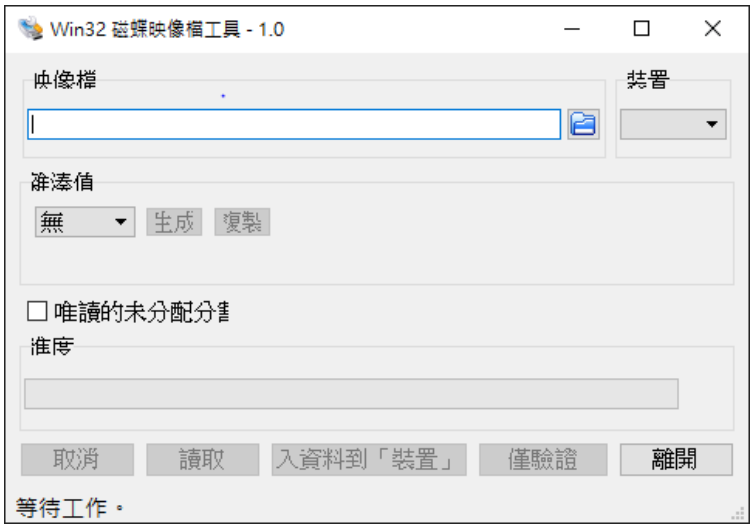
In the end, if you sign in the account of VNC, you can remote control the Raspberry in the different Internet.

5. Backing up your Raspbian OS:

- Download this for backup - https://sourceforge.net/projects/win32diskimager/

  Set the filename and choose the SD card you want to backup.

  Then click write.



6. **Installing Conda:**

Open the terminal of the Raspberry pi and enter the command below

```
wget https://github.com/jjhelmus/berryconda/releases/download/v2.0.0/Berryconda3-2.0.0-Linux-armv7l.sh

bash Berryconda3-2.0.0-Linux-armv7l.sh
```

After installation you can also update the conda version.

```
conda update conda
```

And check the conda version.

```
conda --version
>> conda 4.3.29
```

7. **Installing Jupyter Notebook:**

The Raspberry pi already has Python that see which version we have..

```
python –version
>> Python 2.7.16
```

And check that do we have Python 3 yet?

```
python3 --version
>> Python 3.7.36
```

Two steps above show that the preset Python version is Python 2.
Now we should turn the environment into Python 3.

Login the root account.(Now you don’t have to enter sudo)

```
sudo su -
```

Update system.

```
apt-get update
```

Update pip.

```
pip3 install --upgrade pip
```

Reboot.

```
reboot
```

Install Jupyter Notebook

```
sudo pip3 install jupyter
```

8. **Create a virtual environment using Conda:**

Create a virtual environment.

```
conda create --name myenv python=3.5
```

Run the virtual environment.

```
source activate myenv
```

Install the packages –

- numpy
- scipy
- matplotlib
- pandas
- scikit-learn
- rpi.gpio (This is not available in conda repository. Use pip to install it)

```
conda install _____(packages above)
```

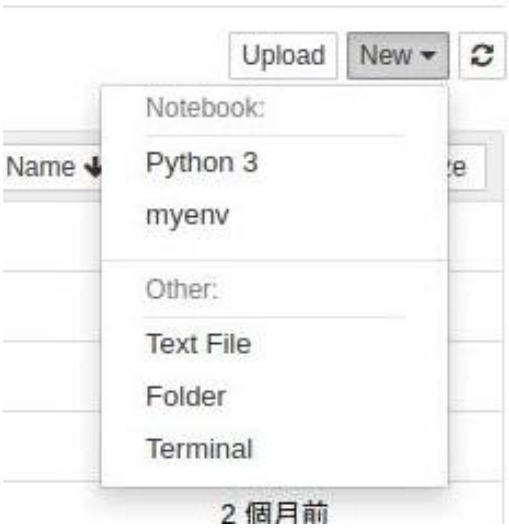
Run the virtual environment. And install ipykernel.

```
source activate myenv
pip install ipykernel
```

Add the kernel to Jupyter notebook.

```
python -m ipykernel install --user --name myenv –
display-name " myenv "
```

Then you can see the new kernel.



9. **Run a Jupyter Notebook with the above installed packages:**

Create a new file and enter the code below.