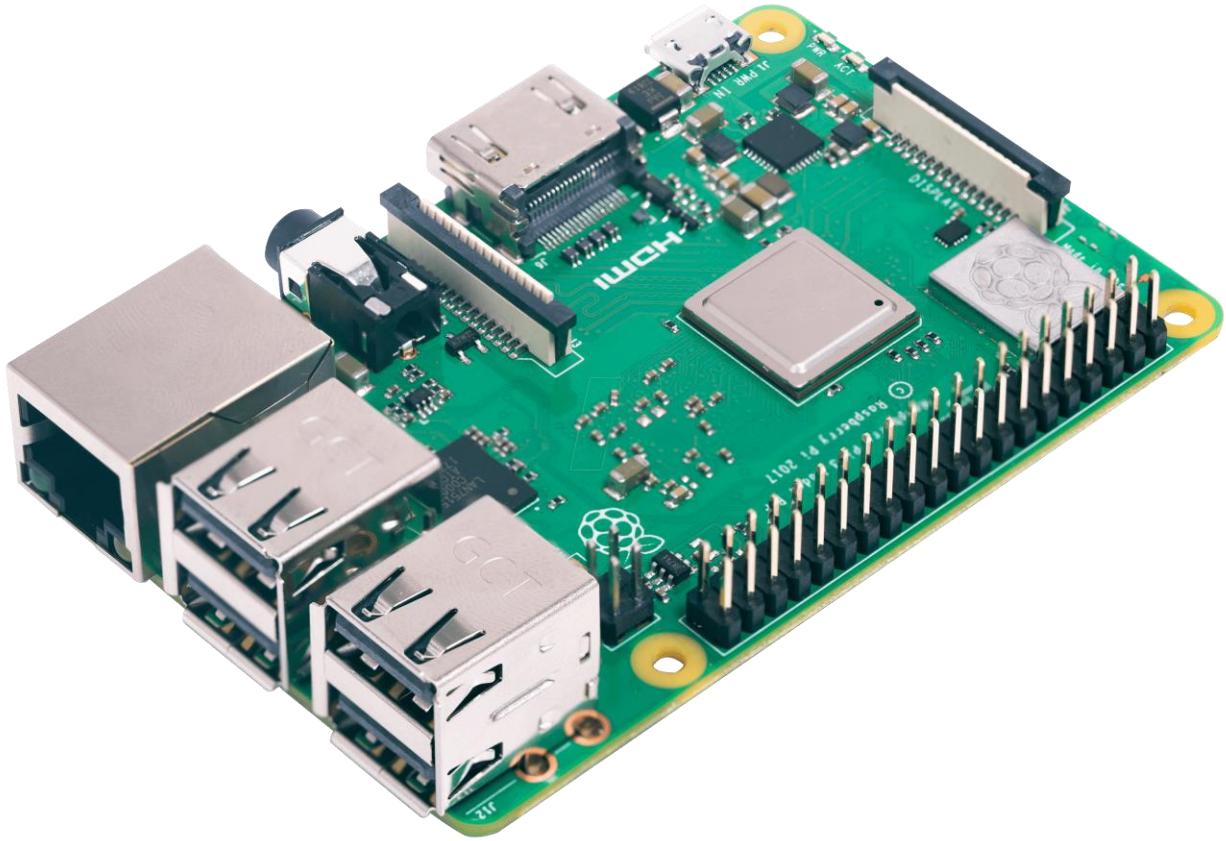
Practical 1 :

Starting Raspbian OS, Familiarising with Raspberry Pi Components and interface, Connecting to ethernet, Monitor, USB.

What is Raspberry Pi?

The Raspberry Pi is a mini computer that was specifically created to make tech learning easier. It has a lot of components for computer-based projects, like USB ports, an ethernet port, an SD card slot, Wi-Fi antenna ports, and more.



It does not come with peripherals, like cables, a keyboard, a mouse, or a monitor. It is great for learning program languages, like Python, Scratch, and Wolfram. Most Raspberry Pi enthusiasts like making single-process builds to show off their do-it-yourself talents.

For example, you could create a dedicated gaming device or an external storage box for movies and music. There are a plethora of Raspberry Pi projects that cover all manner of possibilities,

each one with different specifications. We have a guide for getting started with Raspberry Pi to help you understand what you will need for your first (or next) project.

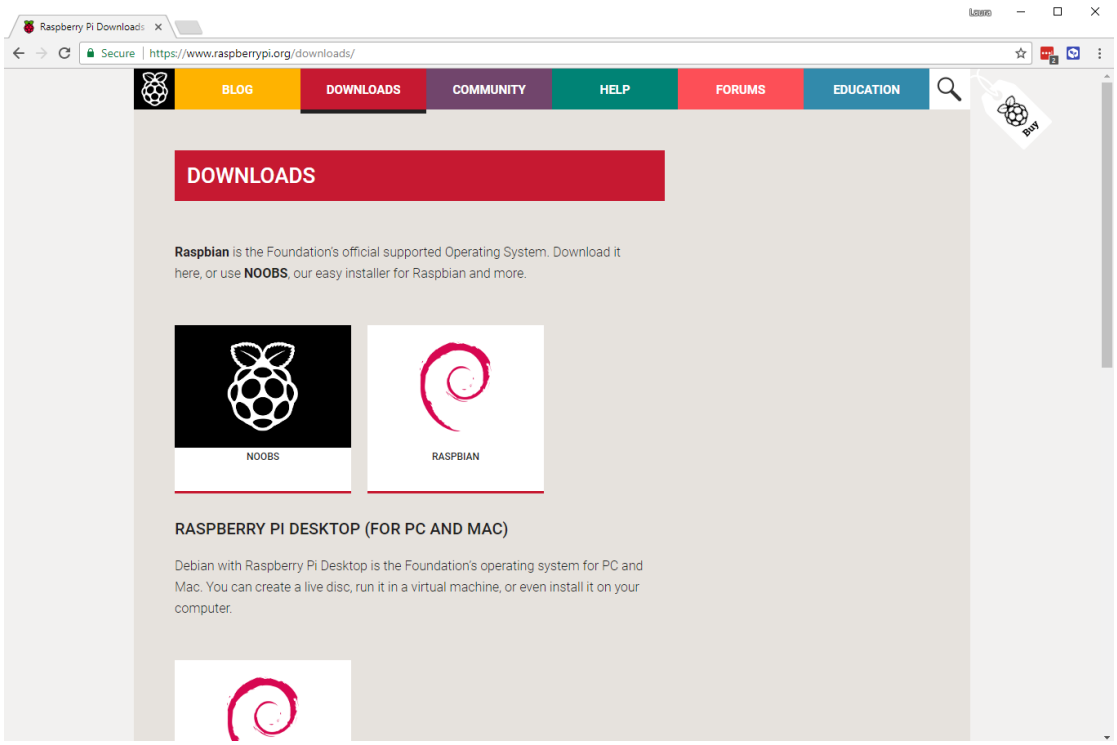
What you will need

The Raspberry Pi ships as just the single-board minicomputer. There are a few additional components you will need before you can get started. So, when making your purchase, keep in mind that you'll need the following extras.

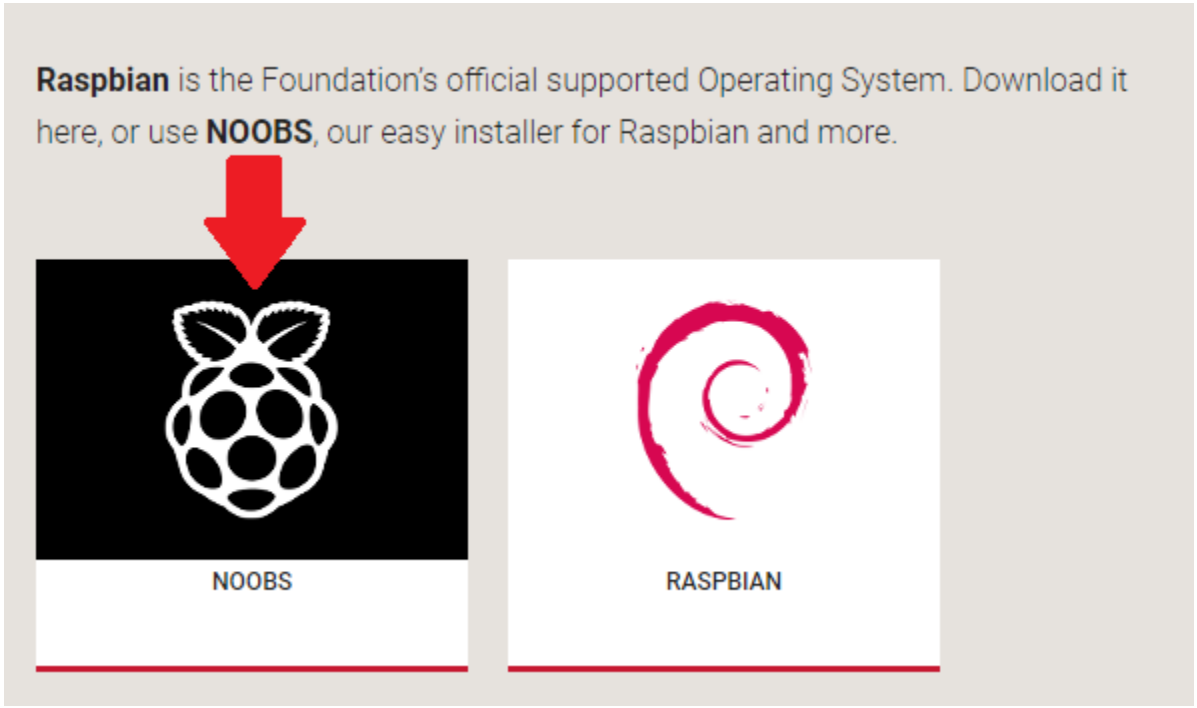
1. **Raspberry Pi —** There are six different models of Raspberry Pi. The Pi 2 Model B or Pi 1 Model B+ and Pi 3 Model B are ideal for beginner projects because they are the most versatile and have the widest range of capabilities. The Pi 3 Model B has the added bonus of having a quad-core processor and 1 GB of RAM so it supports heavier operating systems, like Ubuntu and Microsoft 10. The Model A+ is a powerful board for building robotics, but doesn't have an Ethernet port and only comes with one USB port. So, it's better for people that are a little more savvy with engineering technology. Raspberry Pi Zero is basically a miniature version of the Model A+, but has a more robust computing power. It has a micro USB port and mini HDMI port for 1080p output compatibility but doesn't have wireless capability. It only costs $5 and Adafruit sells v.1.3 for just $5, but you can only buy one per order. The Raspberry Pi Zero W is the same single-board computer as the standard Zero but *does* support wireless and Bluetooth connectivity. It costs $10 on Adafruit, but you can only order one per day.
2. **Power supply —** You will need a 5V micro-USB power supply. You can find them for really cheap online. You may even have one from a non-apple mobile device lying around the house. I recommend the CanaKit 5V power supply.
3. **USB keyboard**
4. **USB mouse —** If you prefer to use a Bluetooth keyboard and mouse, you could just get a Bluetooth adapter. I have a Kinivo BTD-400, but there are dozens of different brands out there.
5. **microSD card —** The microSD card must have at least 8 GB of storage. You can purchase one that comes pre-loaded with Raspberry Pi's New Out of Box Software (NOOBS), but you can also download the software for free from the website, so there is no need to purchase a special NOOBS microSD card.
6. **microSD USB card reader —** You'll need something that you can connect the microSD card to your PC or Mac in order to download software onto it. Adafruit carries one that is perfect for Raspberry Pi, but you can pick one up at just about any electronics or office supply store.
7. **A monitor or TV that supports HDMI or composite video —** You can use an older composite video display, but HDMI works better and supports audio transfers.
8. **An HDMI cable or composite video cable**, depending on what the screen you use supports
    9. **An ethernet cable (or Wi-Fi dongle) —** A connection to the Internet is not required for setup, but many Raspberry Pi projects use them.

Downloading NOOBS

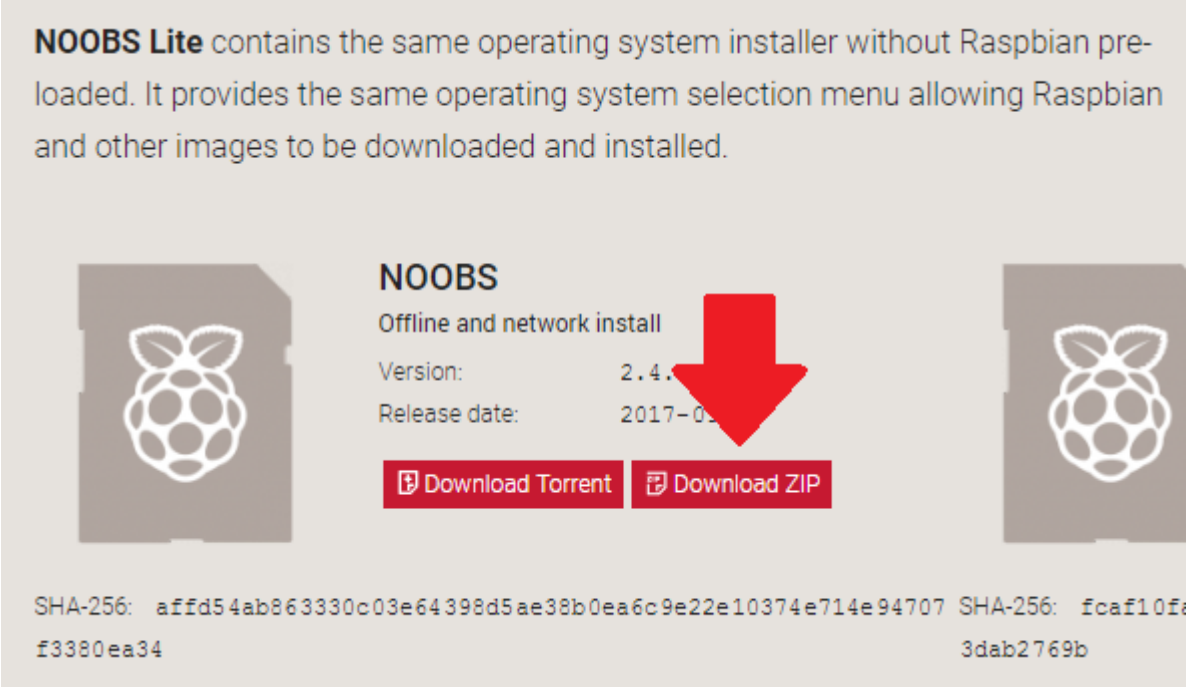
Using NOOBS is the easiest way to install Raspbian on your SD card. To get hold of a copy of NOOBS:



- You should see a box with a link to the NOOBS files. Click on the link.



- The simplest option is to download the zip archive of the files.



Formatting the SD Card

If the SD card on which you wish to install Raspbian currently has an older version of Raspbian on it, you may wish to back up the files from the card first, as they will be overwritten during this process.

- Visit the SD Association's website and download SD Formatter 4.0 for Windows or Mac.
- Follow the instructions to install the software.
- Insert your SD card into the computer or laptop's SD card reader and make a note of the drive letter allocated to it, e.g. F:/.
- In SD Formatter, select the drive letter for your SD card, and format it.

Extracting NOOBS from the zip archive

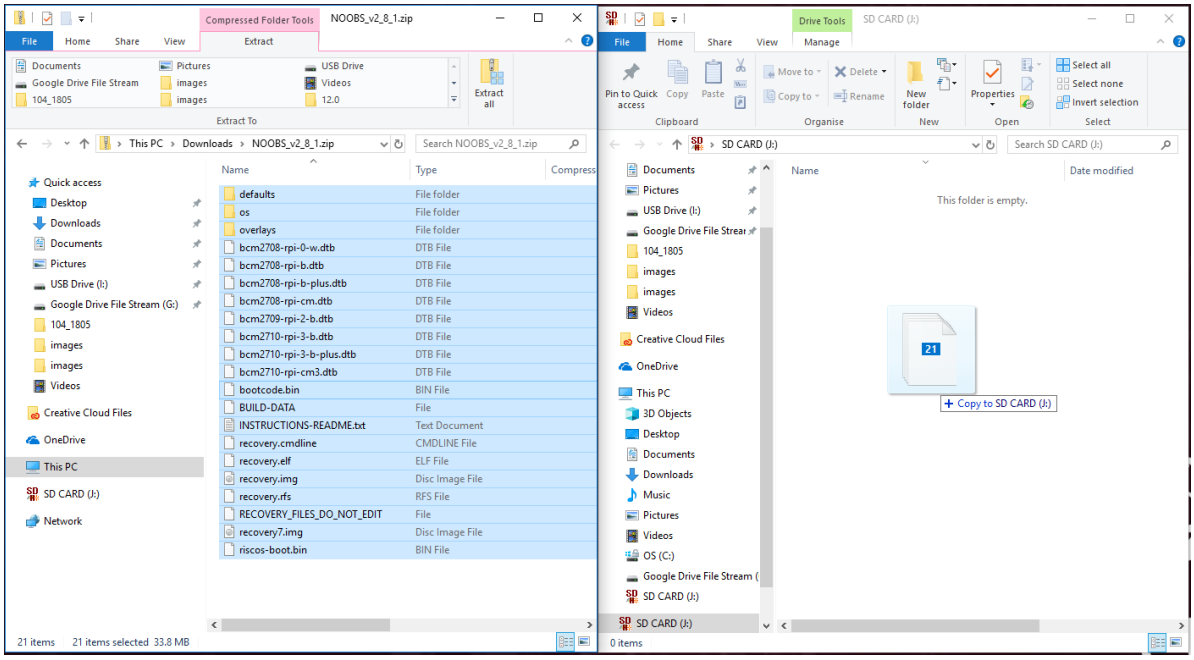
Next, you will need to extract the files from the NOOBS zip archive you downloaded from the Raspberry Pi website.

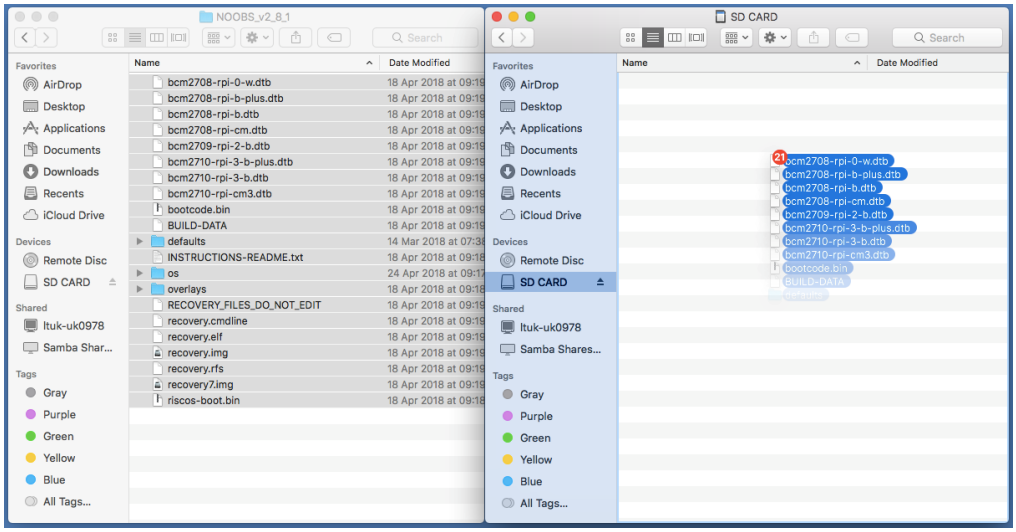
- Go to your *Downloads* folder and find the zip file you downloaded.
- Extract the files and keep the resulting Explorer/Finder window open.

Copying the files

- Now open another Explorer/Finder window and navigate to the SD card. It's best to position the two windows side by side.

- Select all the files from the *NOOBS* folder and drag them onto the SD card.

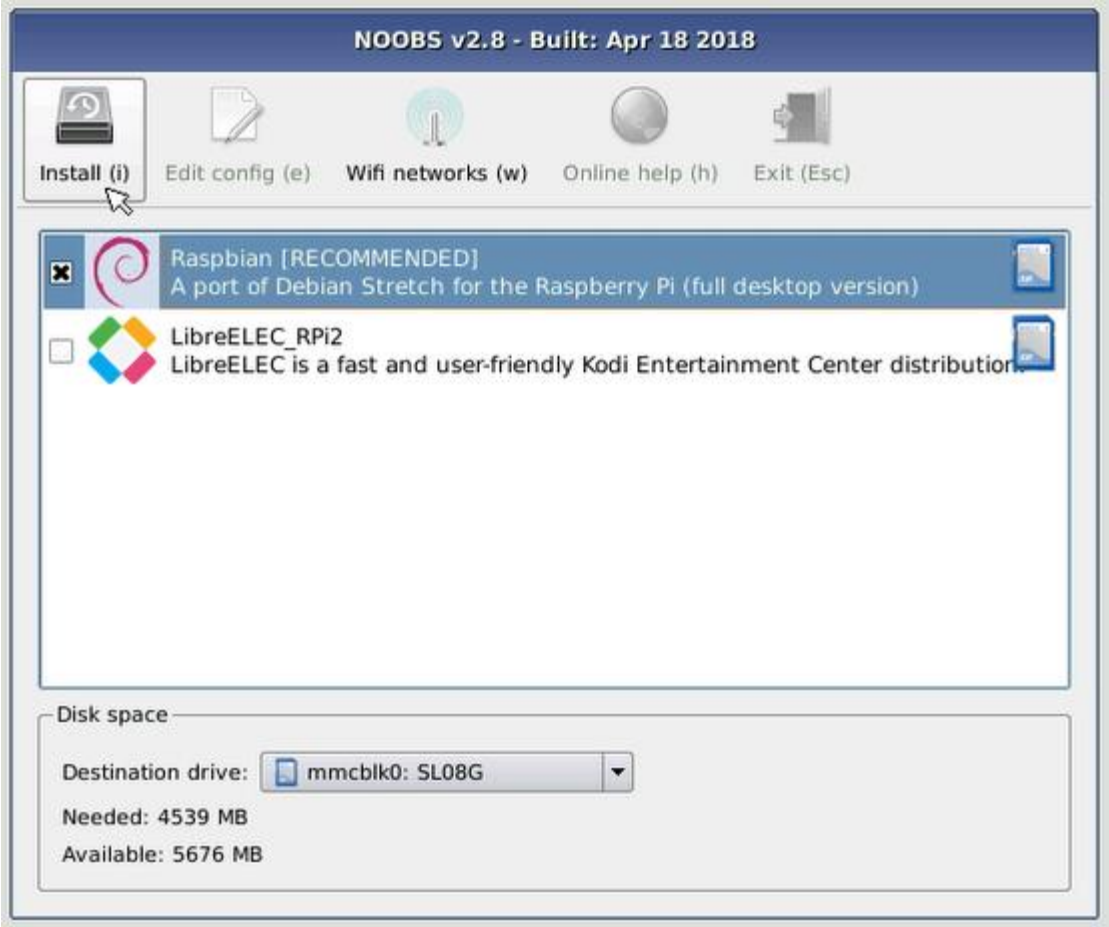




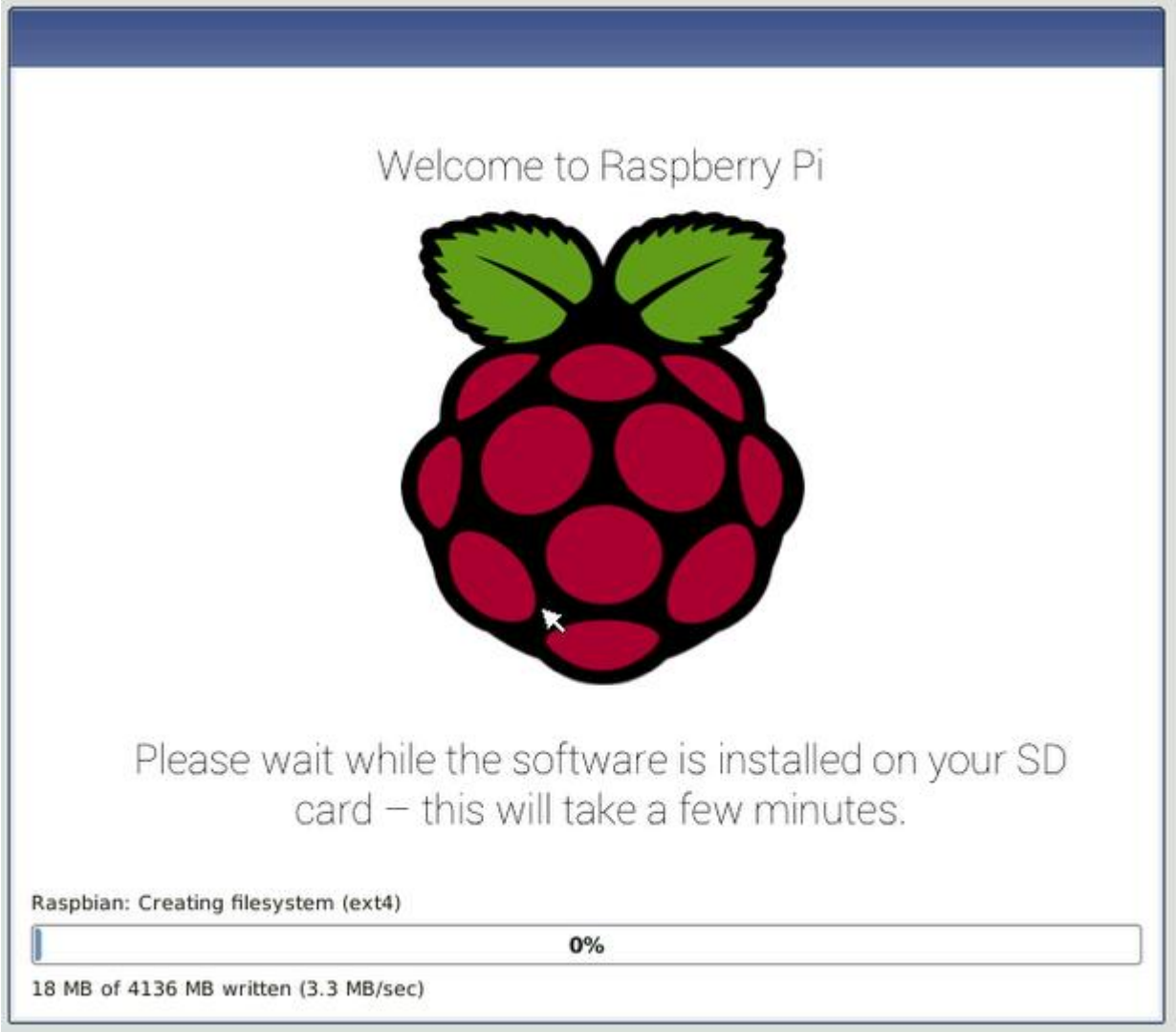
- Eject the SD card.

Booting from NOOBS

- Once the files have been copied over, insert the micro SD Card into your Raspberry Pi, and plug the Pi into a power source.
- You will be offered a choice when the installer has loaded. You should check the box for Raspbian, and then click Install.



- Click Yes at the warning dialog, and then sit back and relax. It will take a while, but Raspbian will install.



- When Raspbian has been installed, click OK and your Raspberry Pi will restart and Raspbian will then boot up.