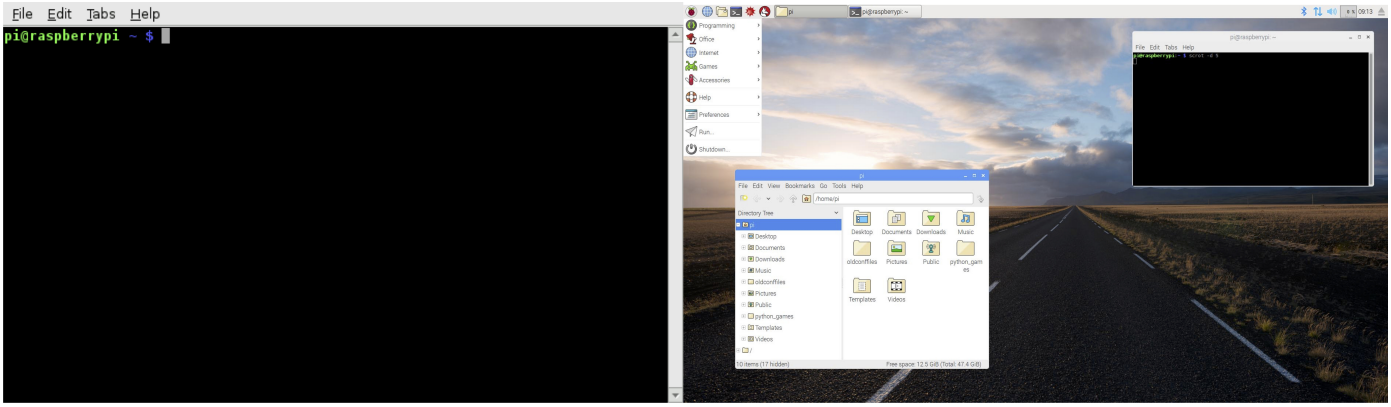
# Operating System Raspbian (Linux)



## Introduction to Raspbian

Raspberry Pi has an operating system called Raspbian, which is the official supported Operating System. Download it here, or use NOOBS, an easy installer for Raspbian and more. Then you have to copy the image to your SD card.

The advantage of having an operating is getting a user interface. It gives easy access to a regular user for giving commands to the computer and do basic things, without writing any code. The user can just sit there and do things with a computer and get results or do something interesting. In general, for any Linux base operative system, you have two different interfaces: **Graphic interface** and **Text-based interface (terminal or console)**.




- Text-based interface (terminal or console)
- Command line (type directly in the terminal)

- Graphic interface
- Pull-down menu
- File system

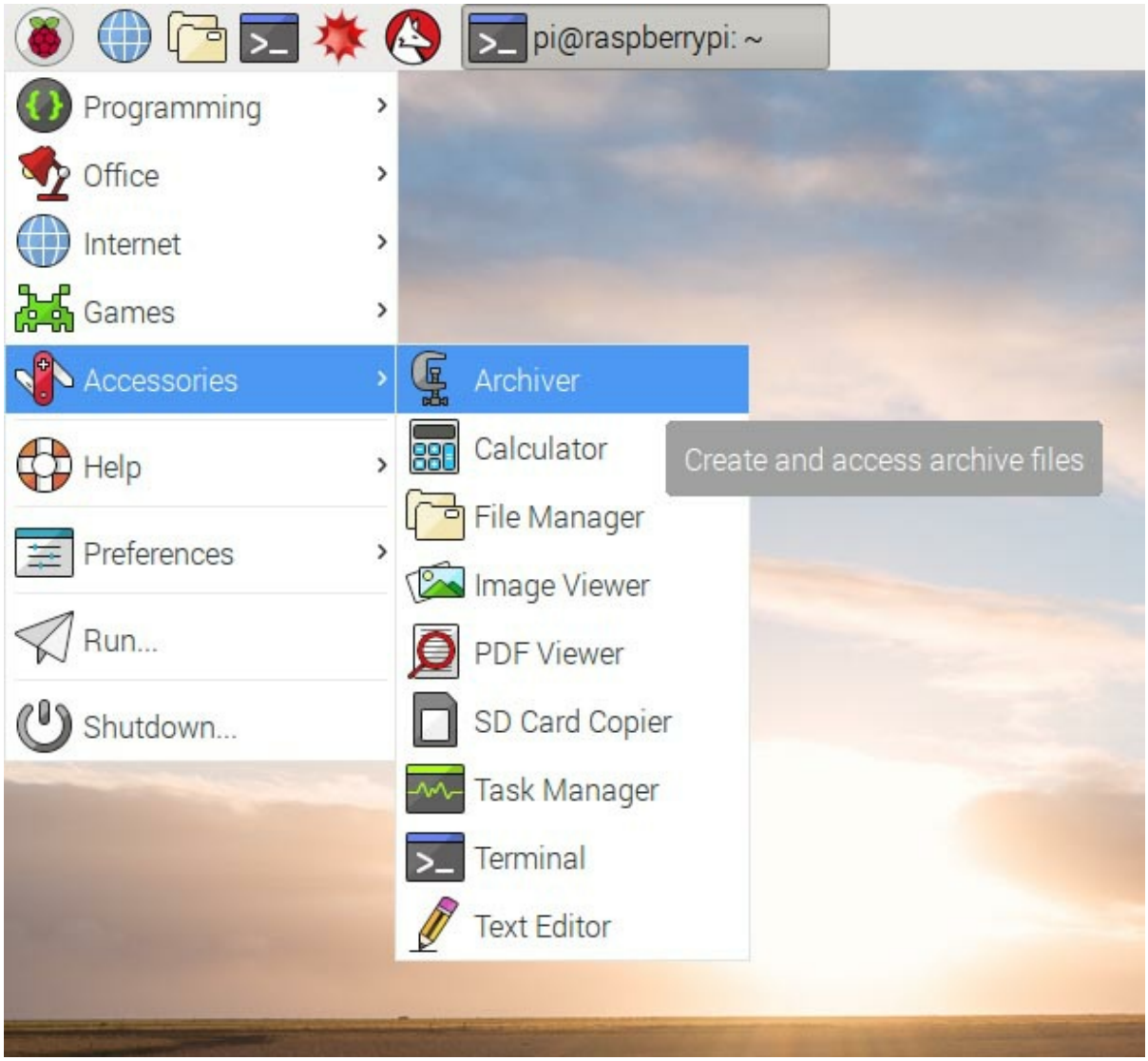
- In the Text-based interface, there are no pull-down menus—you will note a pull-down menu on the top, but it is only accessible when you open the terminal from the Graphic interface, so ignore it for the moment. In the Text-based interface or terminal, you just type commands and it prints out the results.
- By now, you might ask *why not always use the graphic interface?* People are very used to the graphic interfaces nowadays, but before it was possible to have one, the Unix system from which Linux originated was only accessible from a terminal and using command lines. The bright side of having a Text-based interface is that give you more control and accessibility to your operative system. The only thing you have to do is to **memorise some commands or look up for them**. It gives you the possibility to control it, programming it remotely without the usage of many resources—the Graphic interface uses a lot of the RAM memory.
- The Graphic user interfaces even though it is easier to use, it **does not give you access to all the possibilities and capabilities of the operative system**.

In our class, we will stick more with the Graphic interface (it is easier for beginners). However, some tasks are easier to do with the Text-based interface so that we will access the Text-based interface from the Graphic interface to get familiar with the command lines. If you love programming and making prototypes, you will be mostly using the Text-

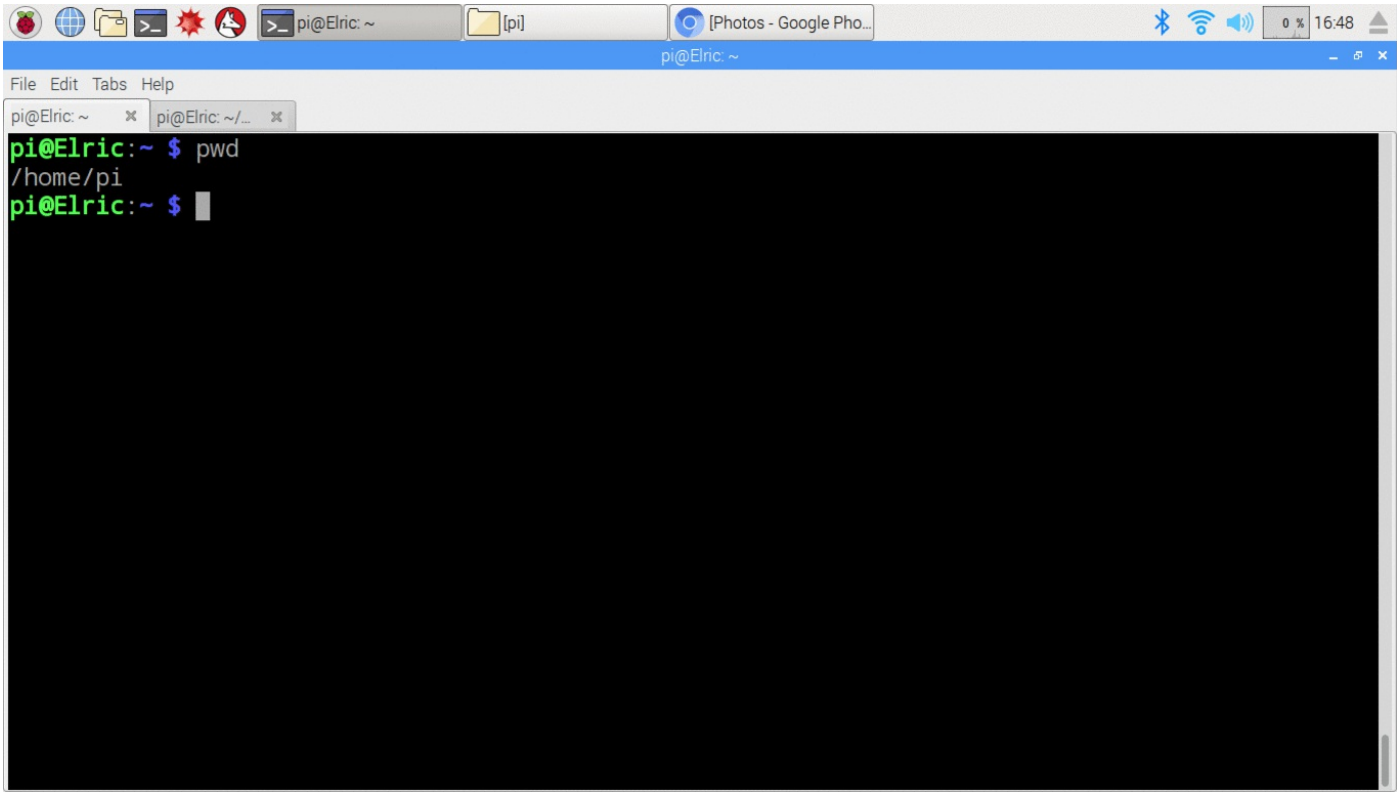
based interface; you will love it!

## Linux Basics

There are many types of Shells, but the one implemented in Raspbian is BASH. So here are some basic commands to start exploring. So open a terminal in your RPI from the icon in the menu bar on the left.




Then we can type some basic commands. For example **pwd**. It shows the path where we are working. Also, we can use **man** which gives information about any Linux command RPI setup. Another useful command is *ls*, which let us know the folders contained in a directory. *ls -alrt* give us more information of the system and it orders in reverse order of how the files were created. There are some basic




You can find more commands here, and you can play to get used to the command line.

# Raspberry Pi Configuration (Optional)

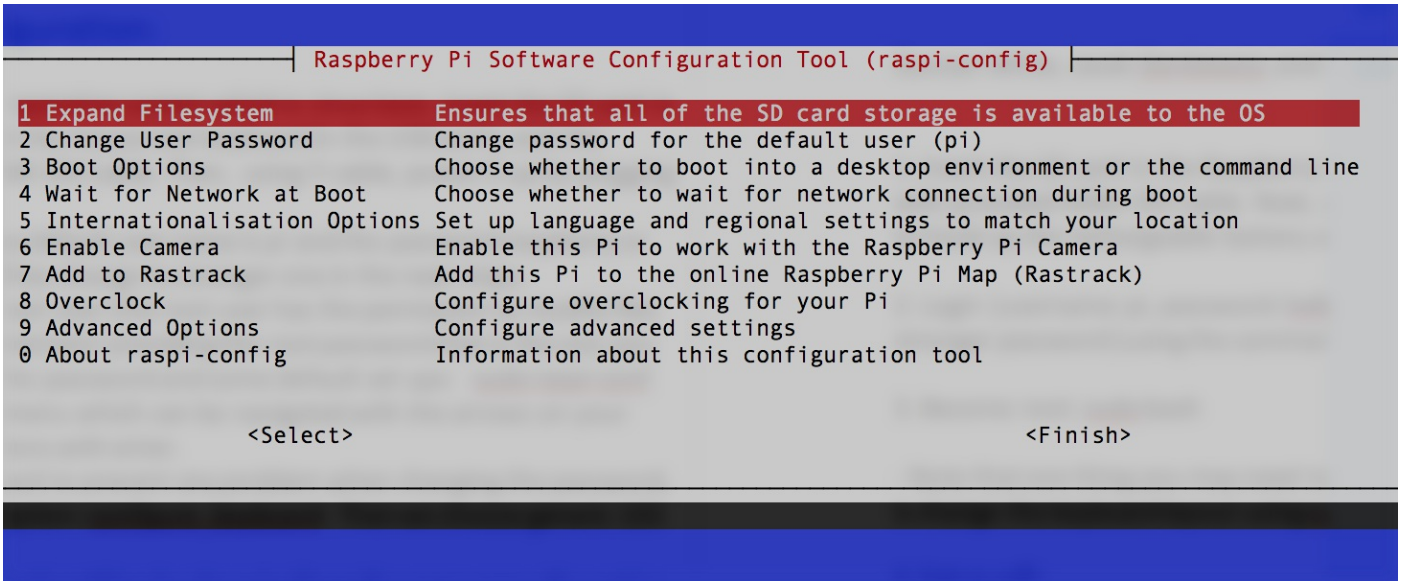
Each team should get a monitor, keyboard and mouse.

- Insert the mini SD card in the Raspberry Pi , connect the mouse and keyboard in the USB ports, and the display with provided HDMI-DVI cable. Then, using Y-cable, power it up by plugging in the charger.
- The operative system starts. Then, click on the **terminal** icon next to the menu to open it.
- Then you need to run some commands in the terminal as root user to configure the Raspberry Pi (RPi). The **root user** has the permission to modify files or default settings as administrator providing the root password. The **root user** is **pi** and the default **root password** is **raspberry**. First we will make stronger the password, but first, we will change some default setups:

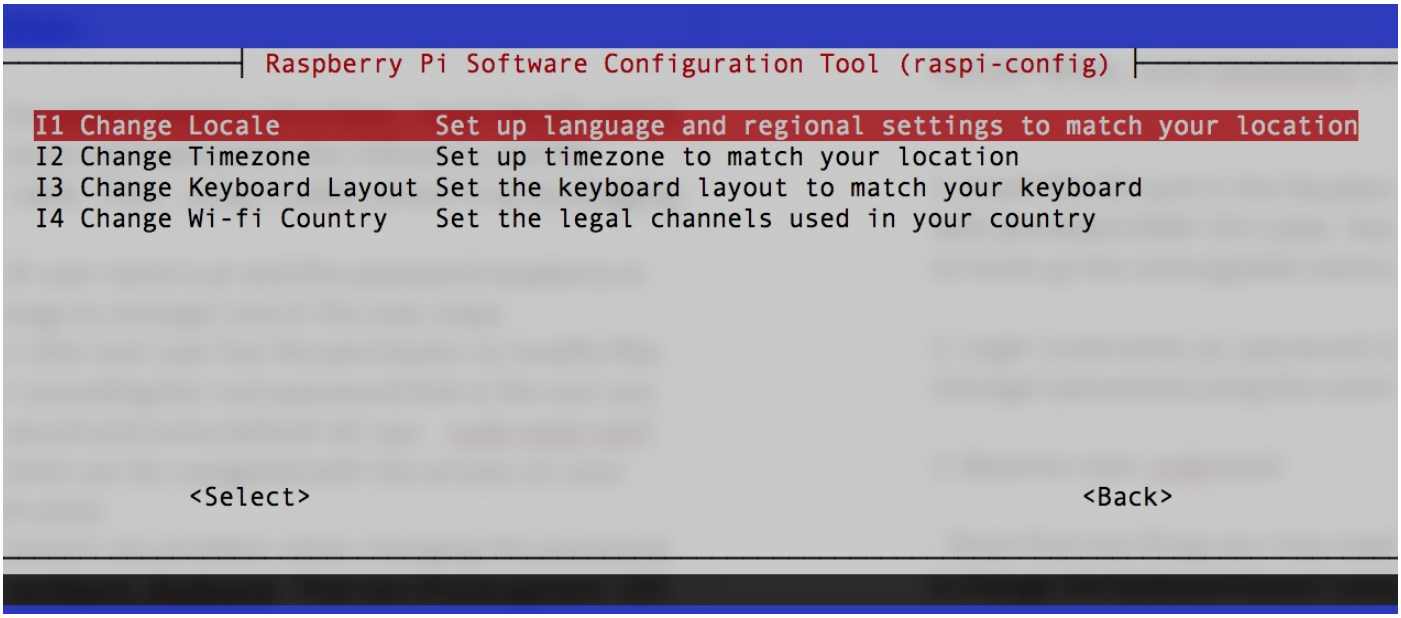
```
$ sudo raspi-config
```

**Note:** To execute any Linux command as root user, the *sudo* command presides the Linux command.

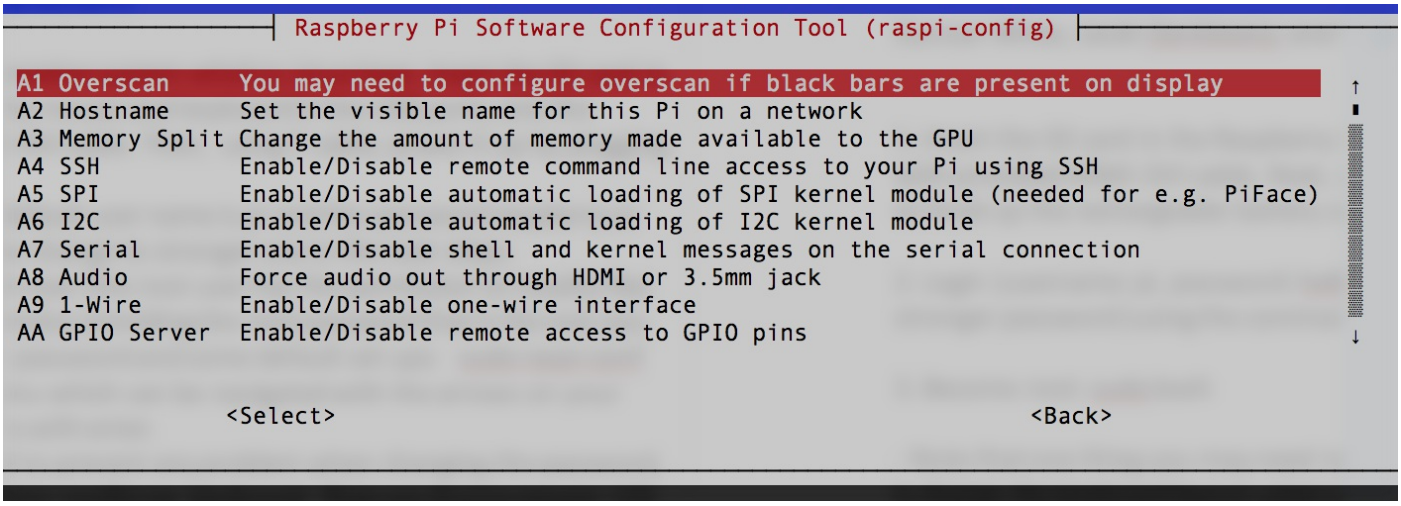
- The terminal will show a menu which can be navigated with the arrows on your keyboard and accept options with Enter.




- Then we set up the keyboard to prevent any problem when changing the password. Therefore we access the option: **Internationalisation Options** → **Change the Keyboard Layout**. Then we choose generic 105 key, and then the UK.
- Also we have the option to change the timezone from this menu.




- To change the password, we return to the main menu and choose the second option. We have to set the new password and do not reboot the RPi yet.
- We check that the ssh for remote network communications is enabled (security shell cryptographic network protocol). We access to the **Advance Options** → **SSH**.




- An optional step is to change the hostname in the same advance menu.
- Then we restart the RPi.