

Installing the Raspberry Pi OS (Raspbian)

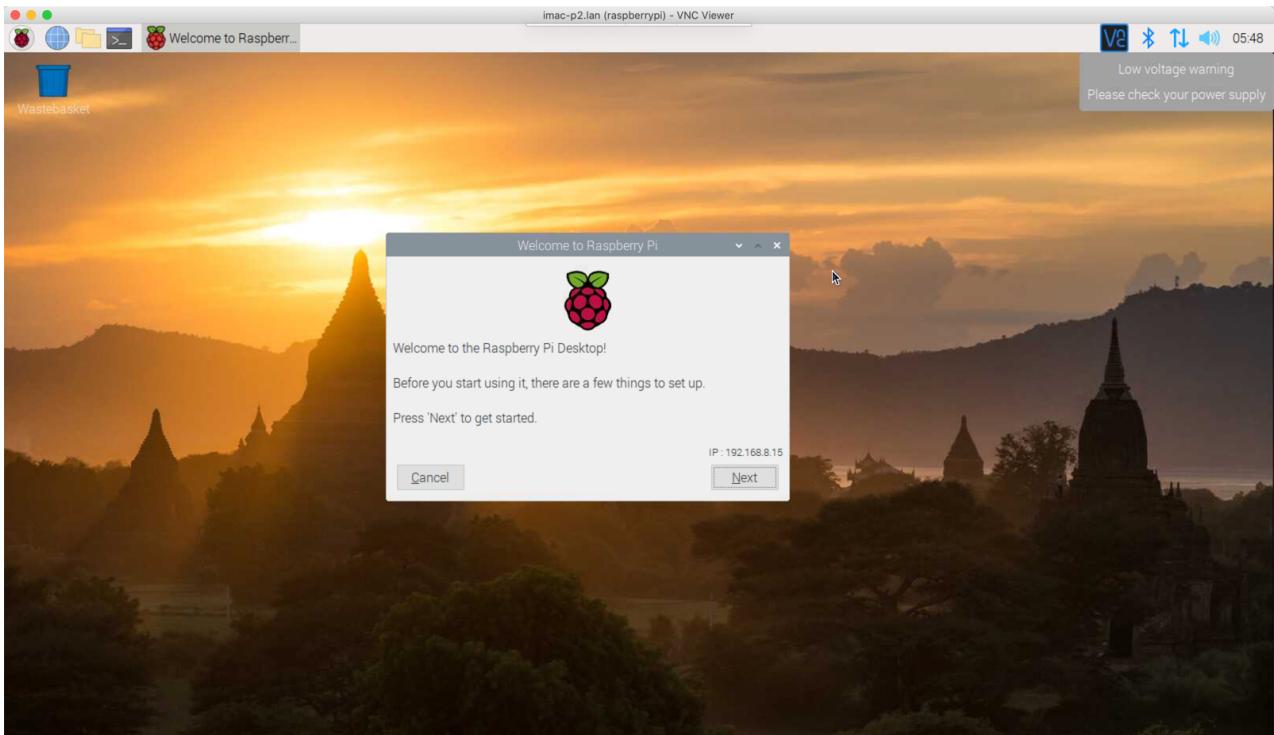
Prepare the SD card with the Rasbian SD Image.

ToDo: Add instructions on writing the SD image...

Enter Initial configuration options.

After booting, the pi user will be logged into the desktop.

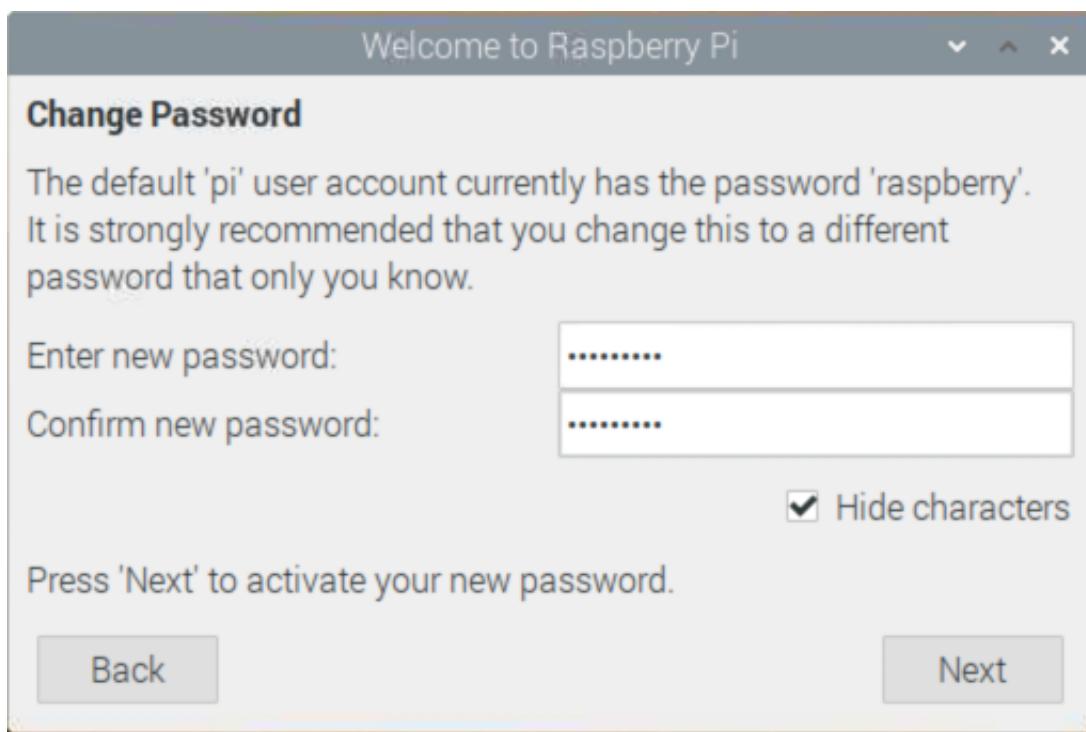
The initial config application is provided to set a few things first.



Click next.



Choose appropriate settings for country, language and timezone and click next.



Set the password for the pi user - make sure to store it somewhere safe.

Welcome to Raspberry Pi

Set Up Screen

The desktop should fill the entire screen.

Tick the box below if your screen has a black border at the edges.

This screen shows a black border around the desktop

Press 'Next' to save your setting.

The change will take effect when the Pi is restarted.

Back

Next

If the screen is OK, click next. Otherwise, you can adjust the settings. It does not have to be perfect. 99% of the time you will not be using the device with a monitor.

Welcome to Raspberry Pi

Select WiFi Network

Select your WiFi network from the list.

DPS



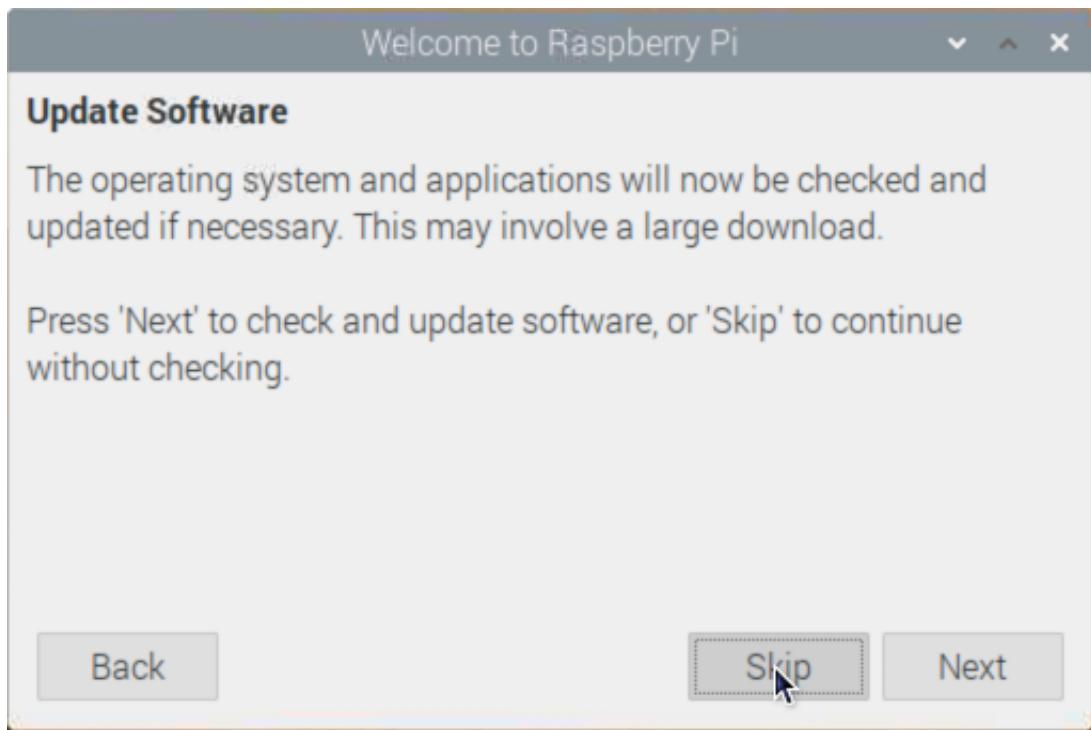
Press 'Next' to connect, or 'Skip' to continue without connecting.

Back

Skip

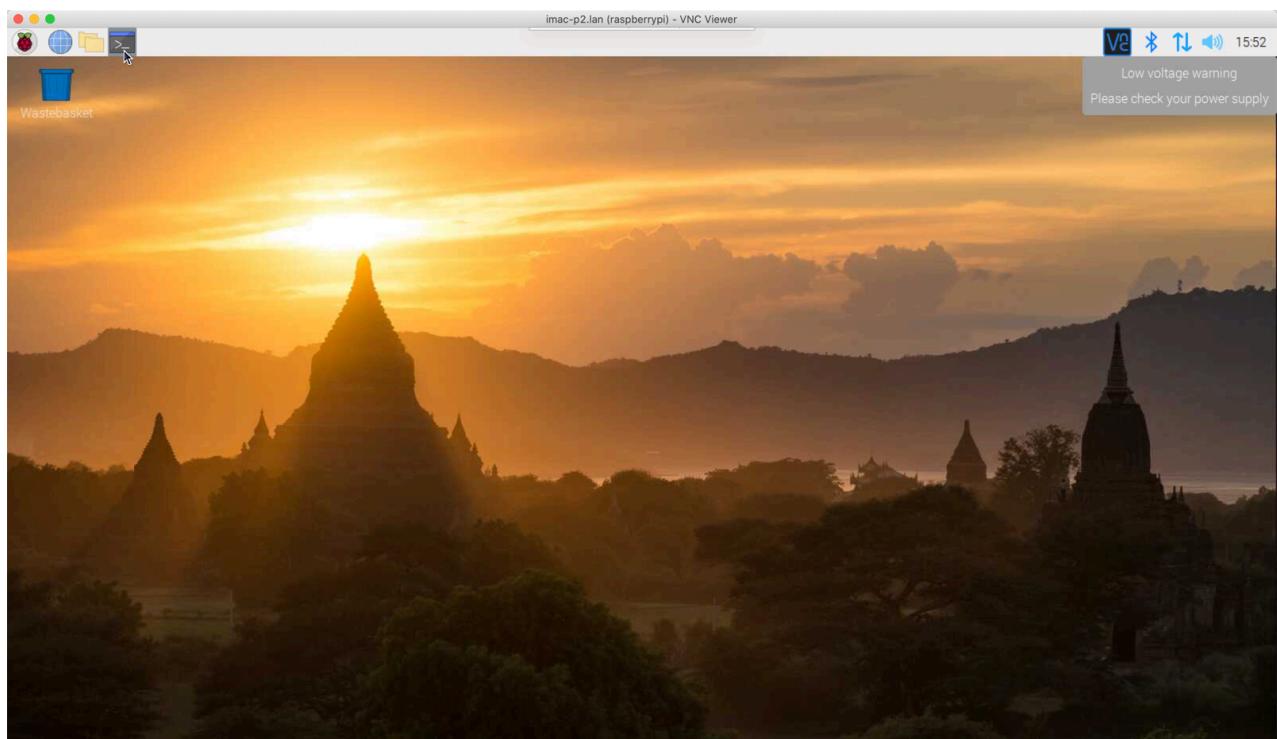
Next

Skip the wifi configuration for now.

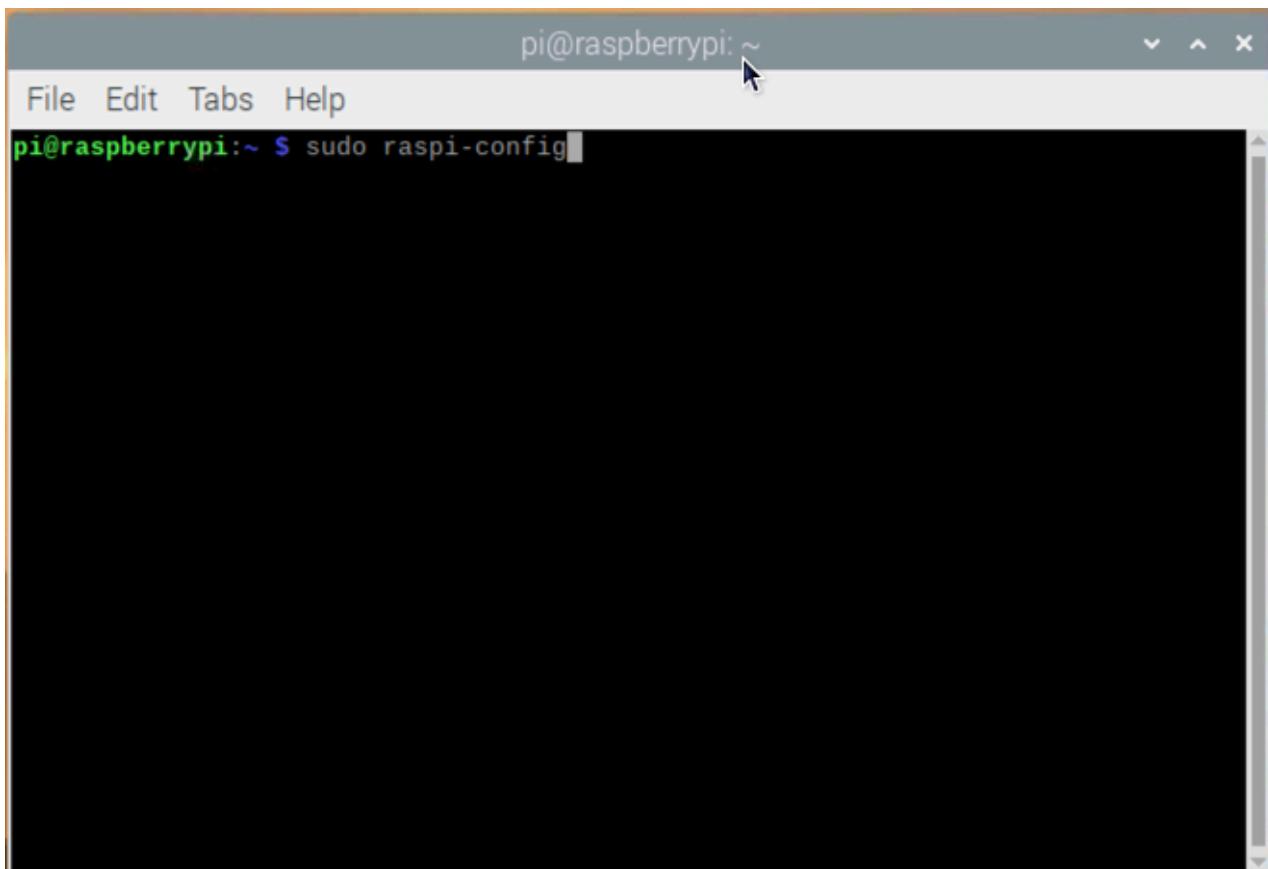


Skip the update for now.

Set up some extra features.



In the top left part of the screen click on the terminal app.



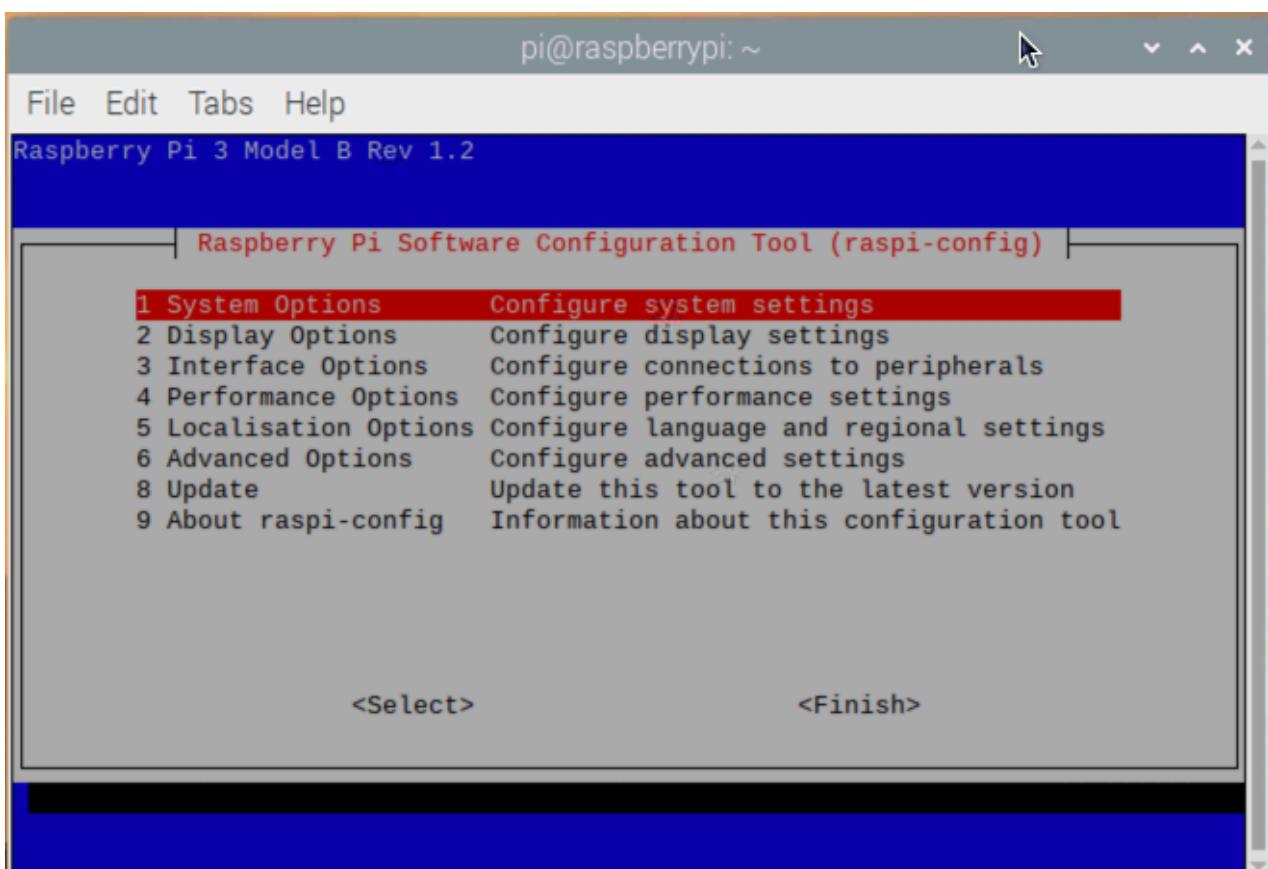
pi@raspberrypi: ~

File Edit Tabs Help

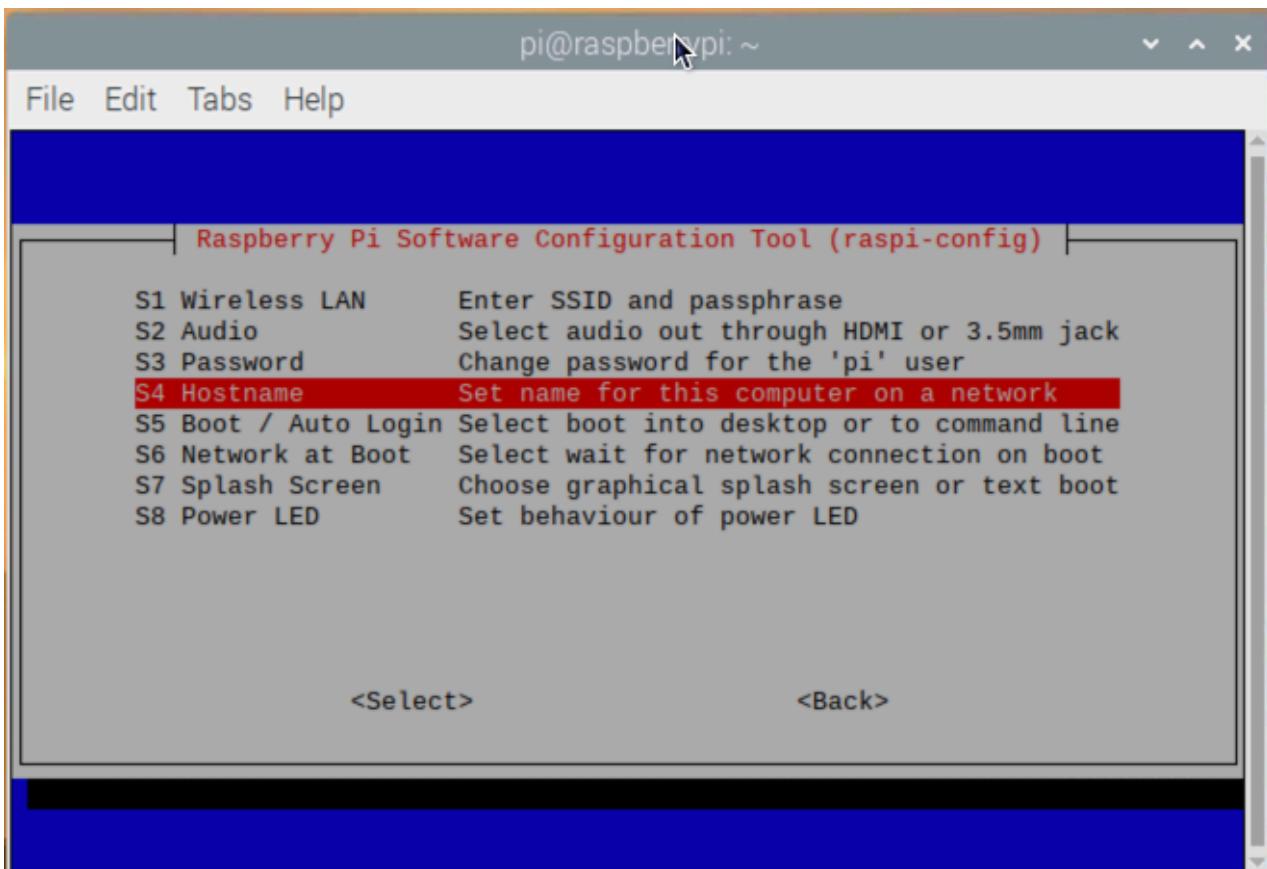
```
pi@raspberrypi:~ $ sudo raspi-config
```

Enter the command:

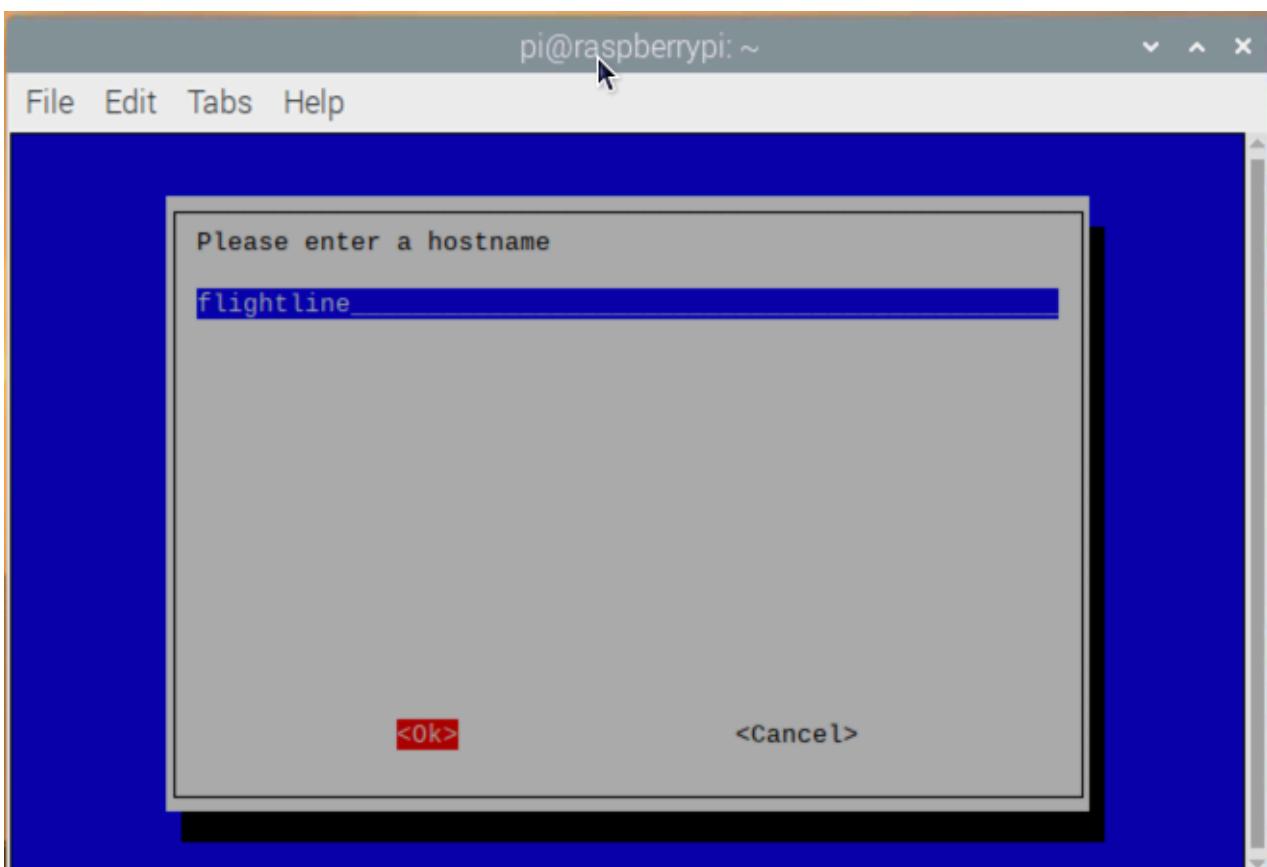
```
sudo raspi-config
```



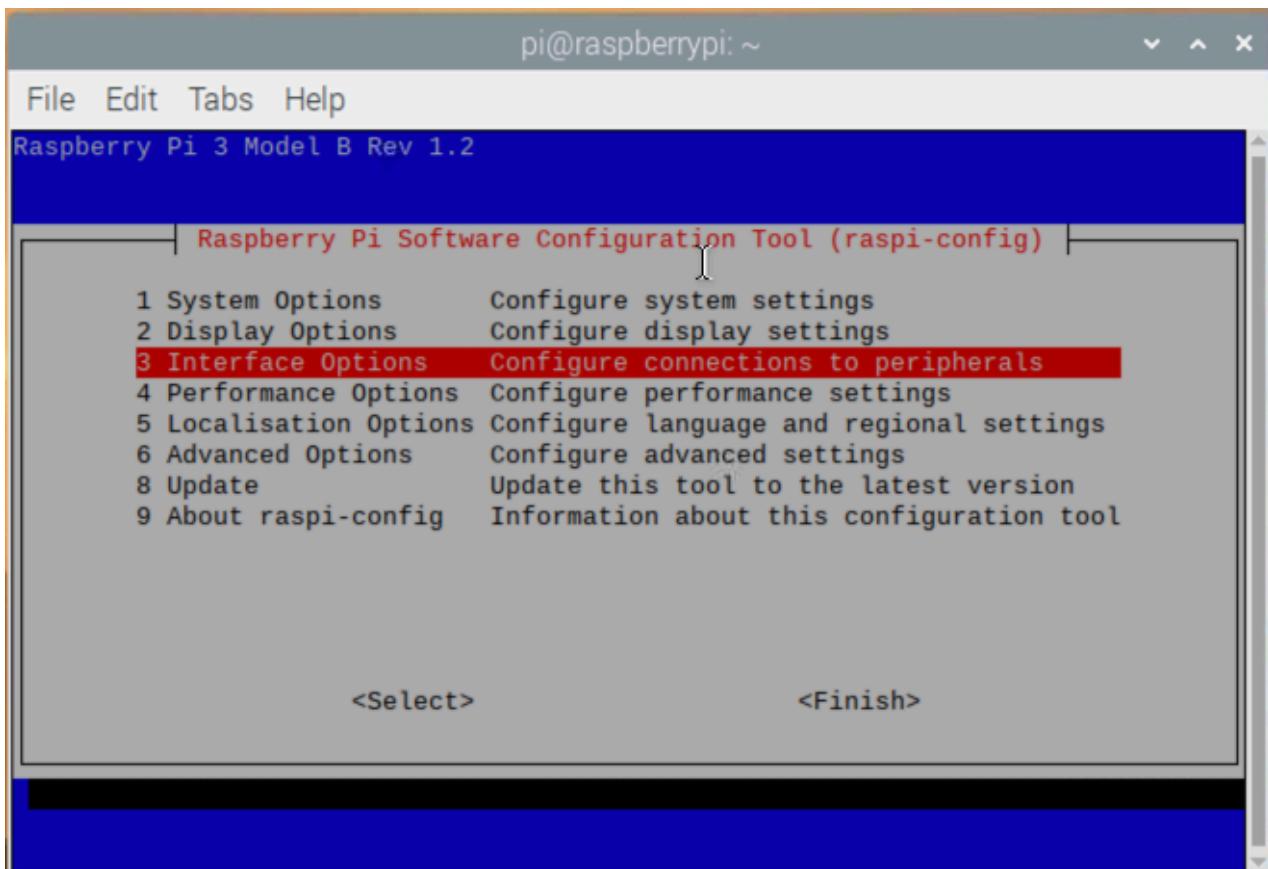
Select the first choice: **System Options** and hit enter.



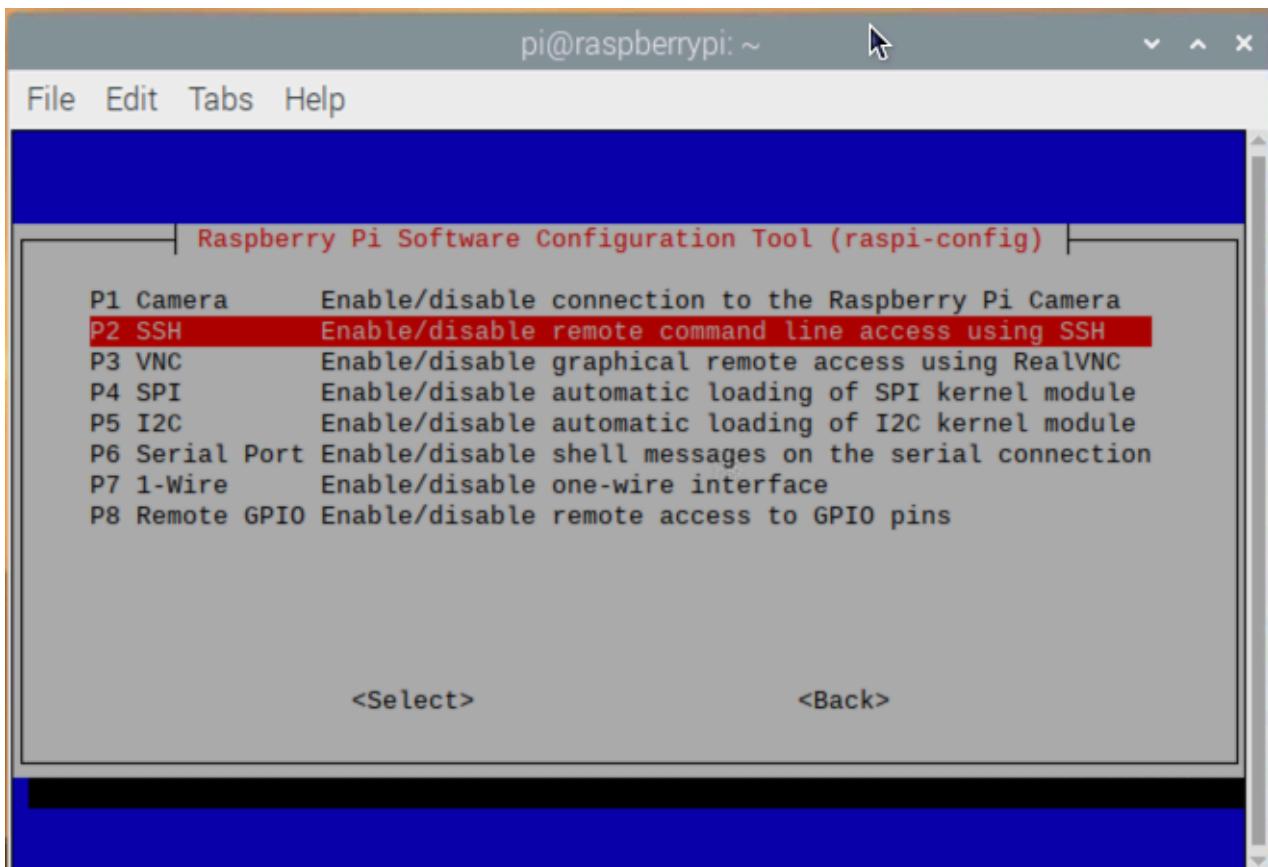
Choose **S4** and hit enter to set a hostname.



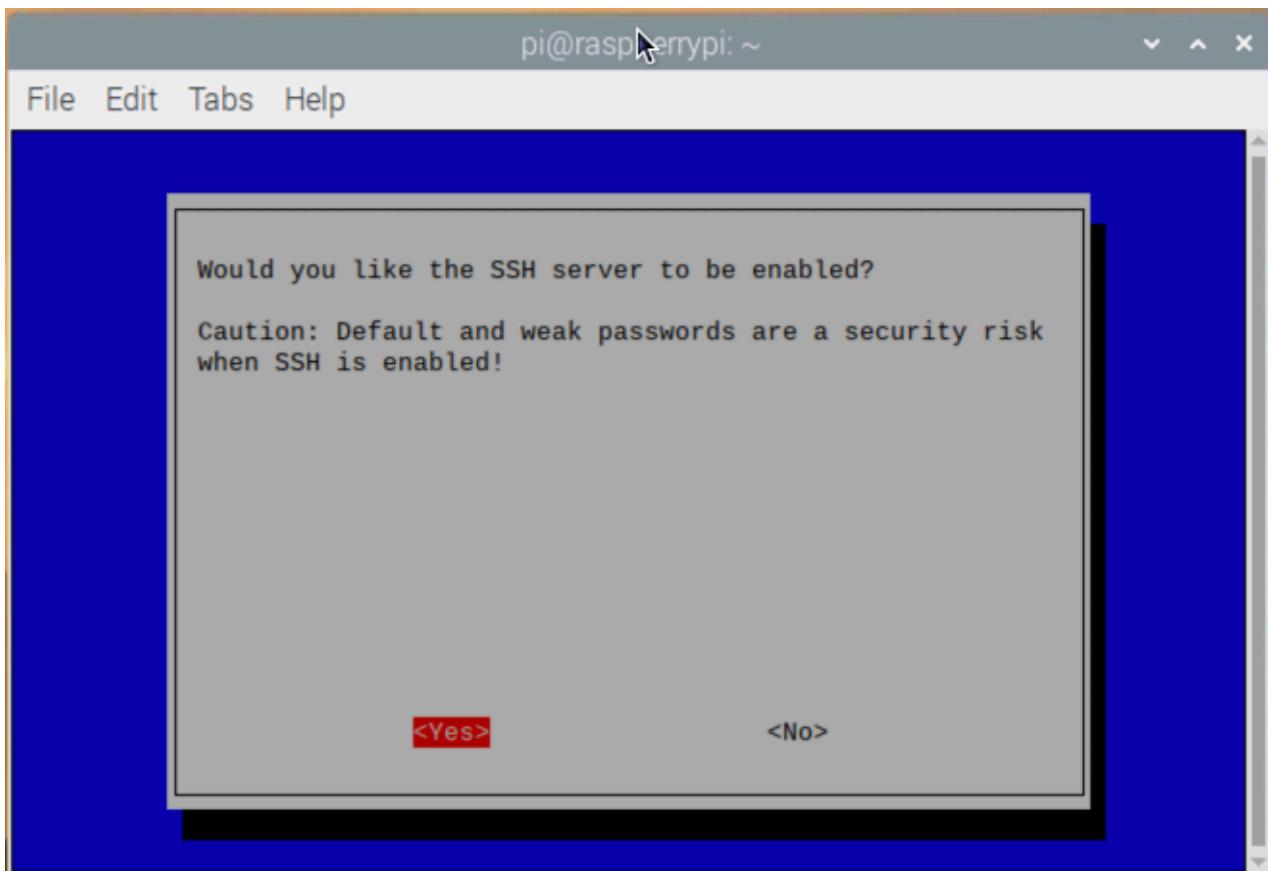
Enter **flightline** and use the arrow keys to select "OK" and hit enter.



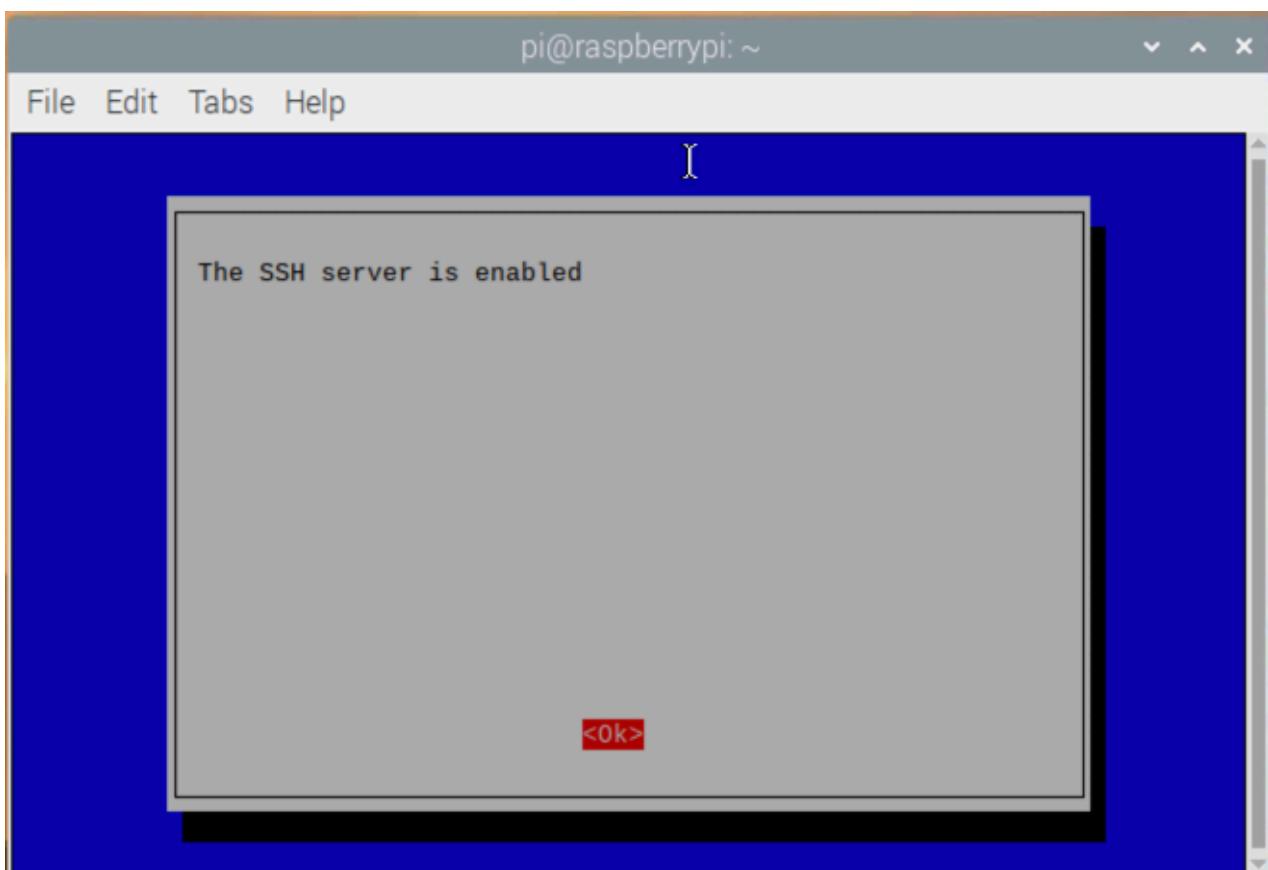
Select the 3rd option **Interface Options**



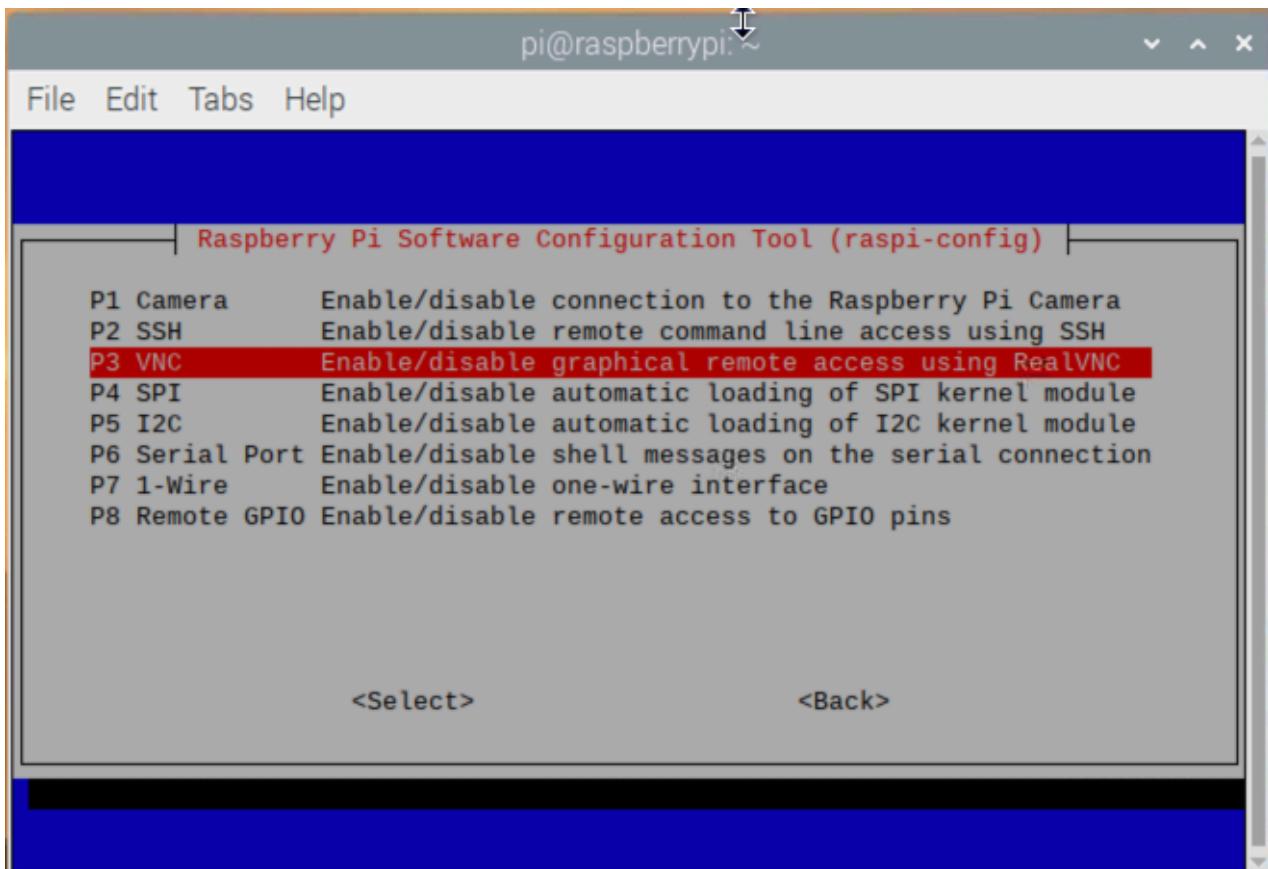
Select **P2 SSH** and hit enter.



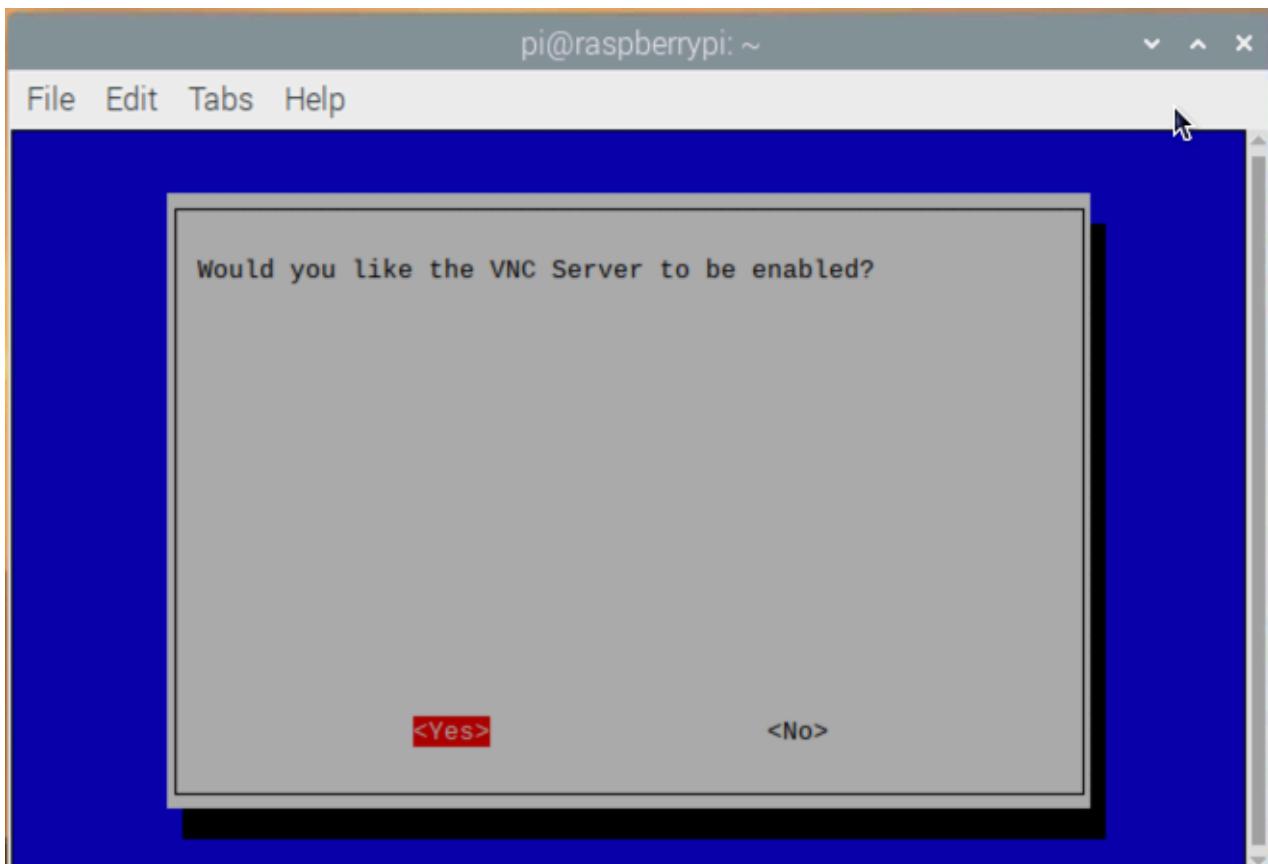
Choose **Yes** to enable the SSH server.



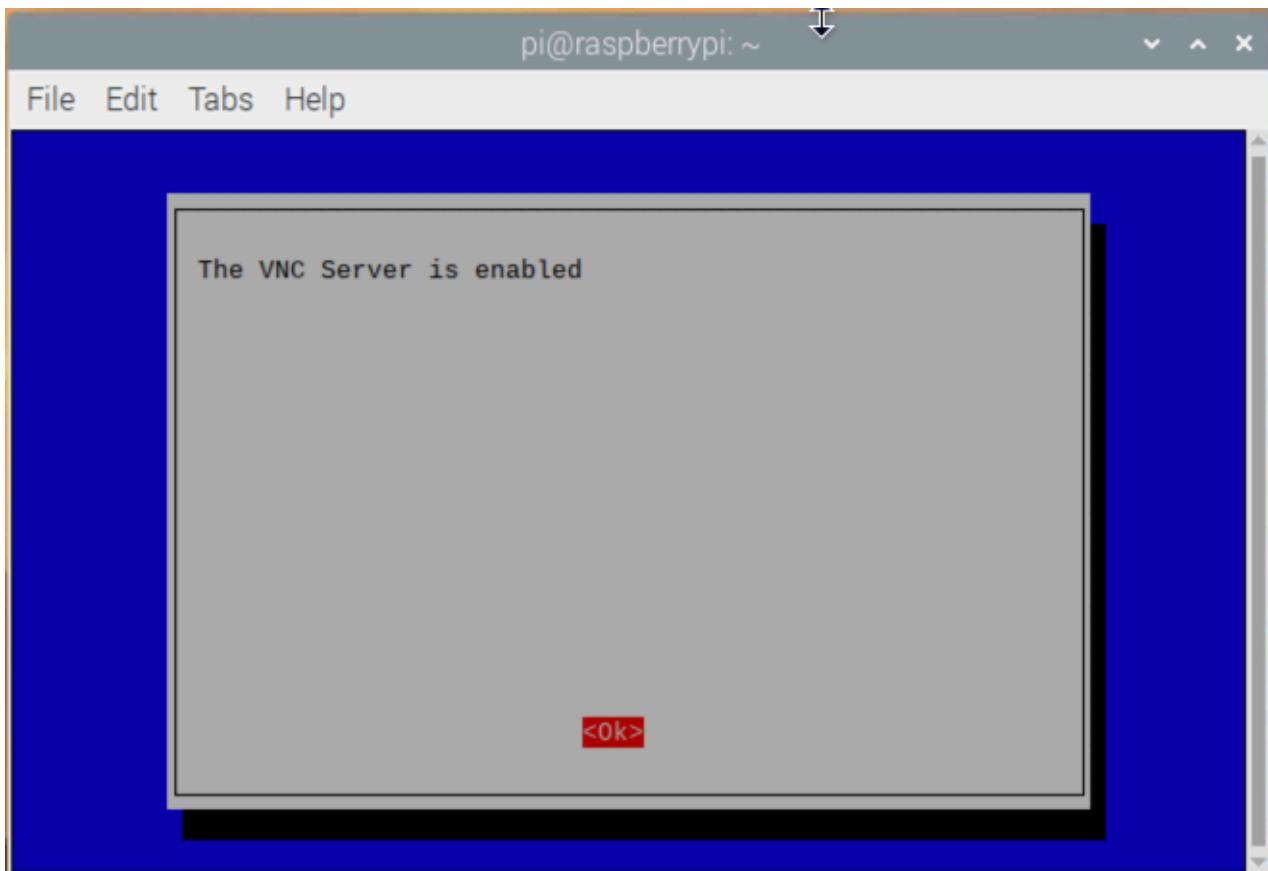
Hit enter to go back to the main menu.



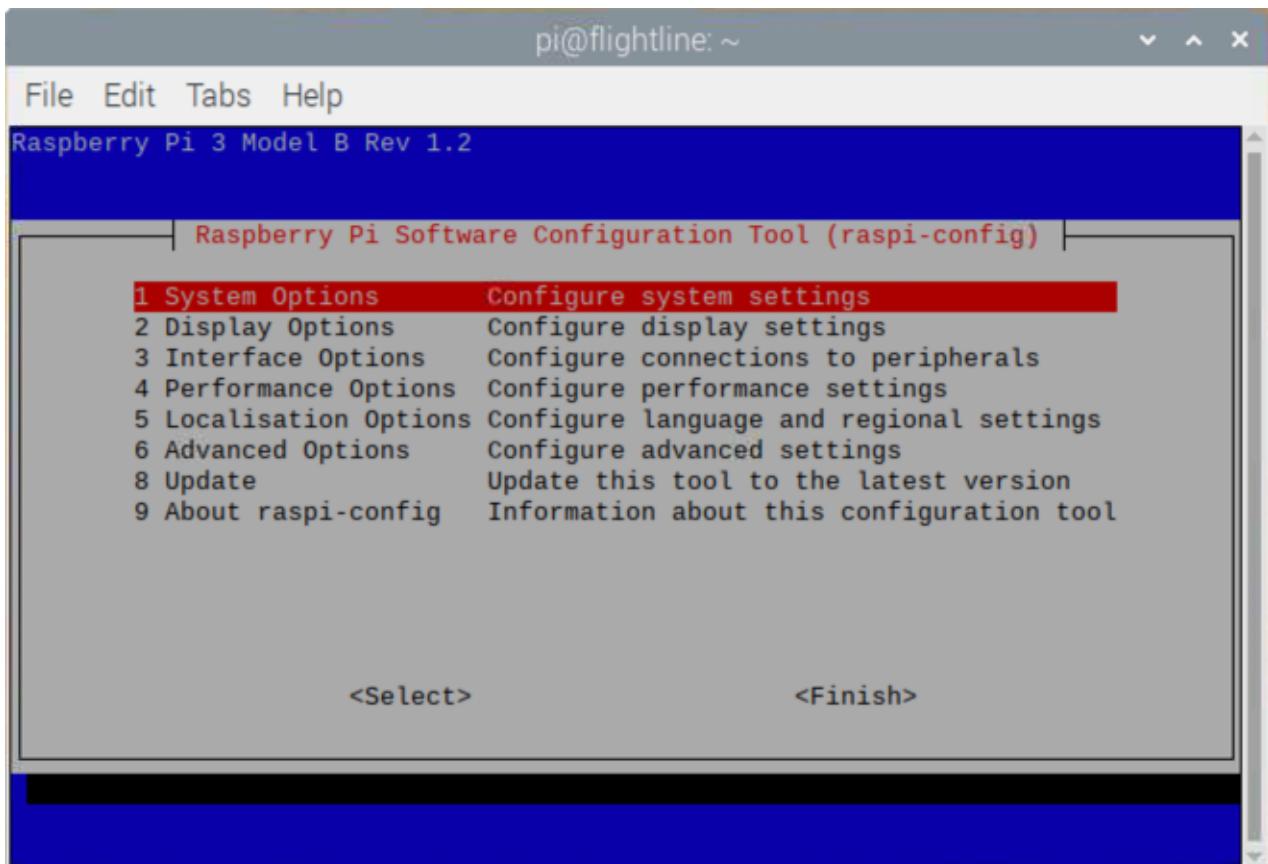
Go back into the Interface options menu, select **P3 VNC** and hit enter.



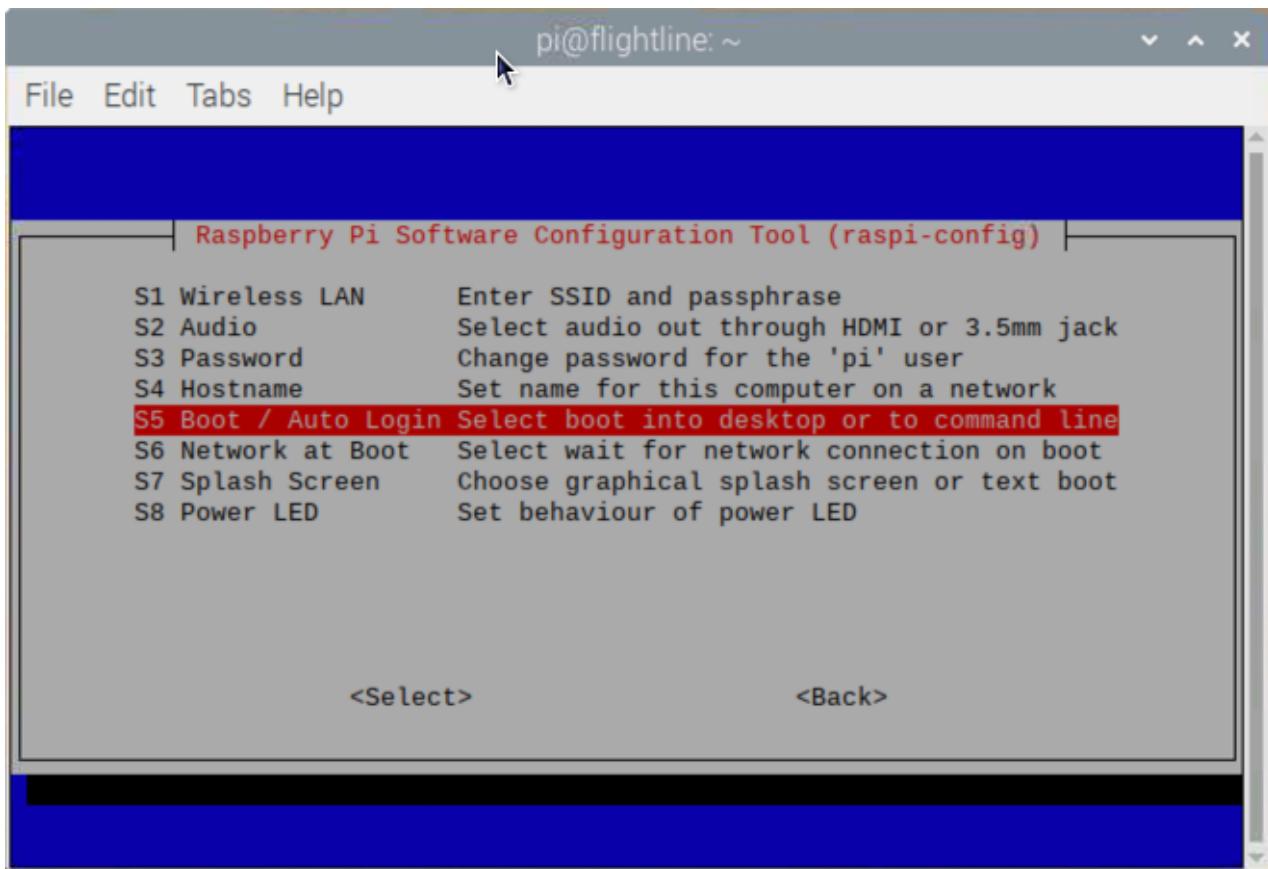
Choose **Yes** to enable the VNC server.



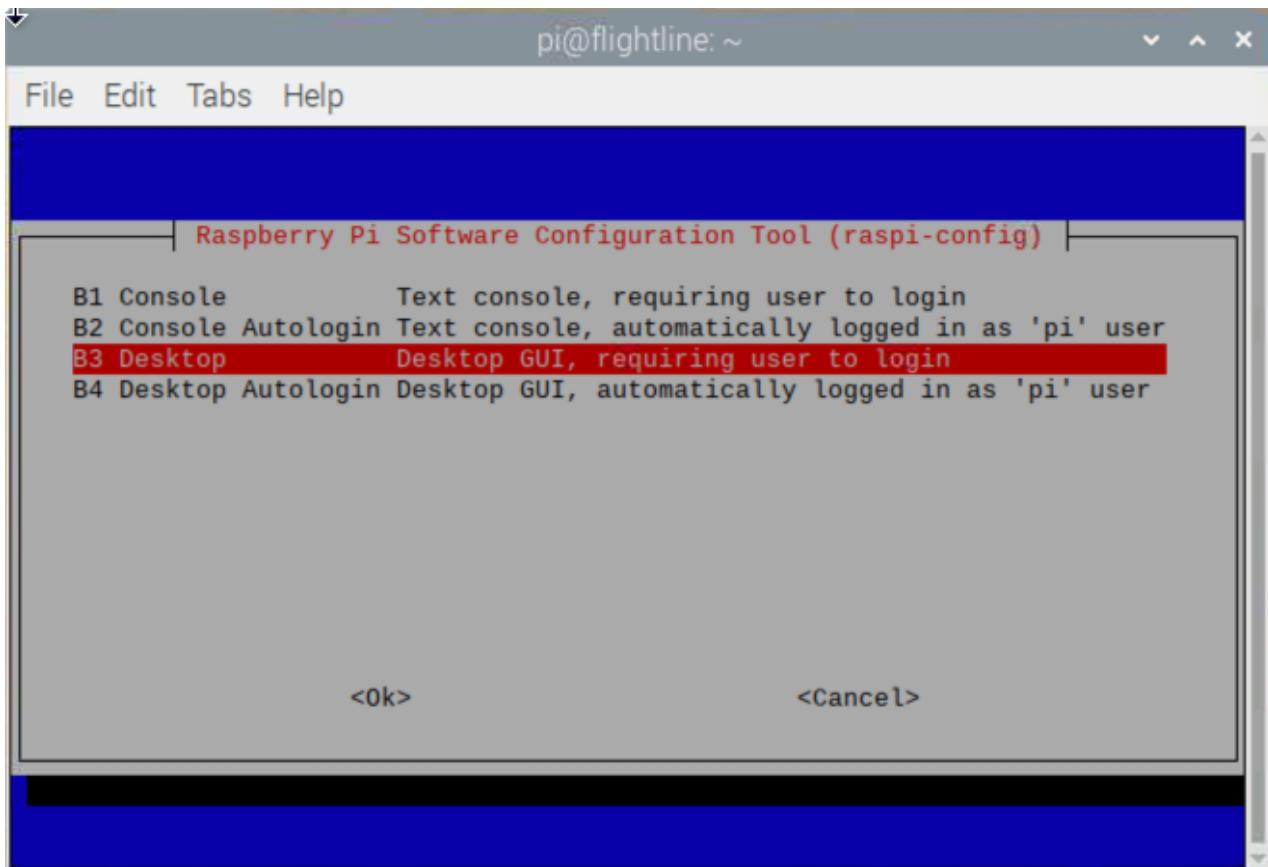
Hit enter to go back to the main menu.



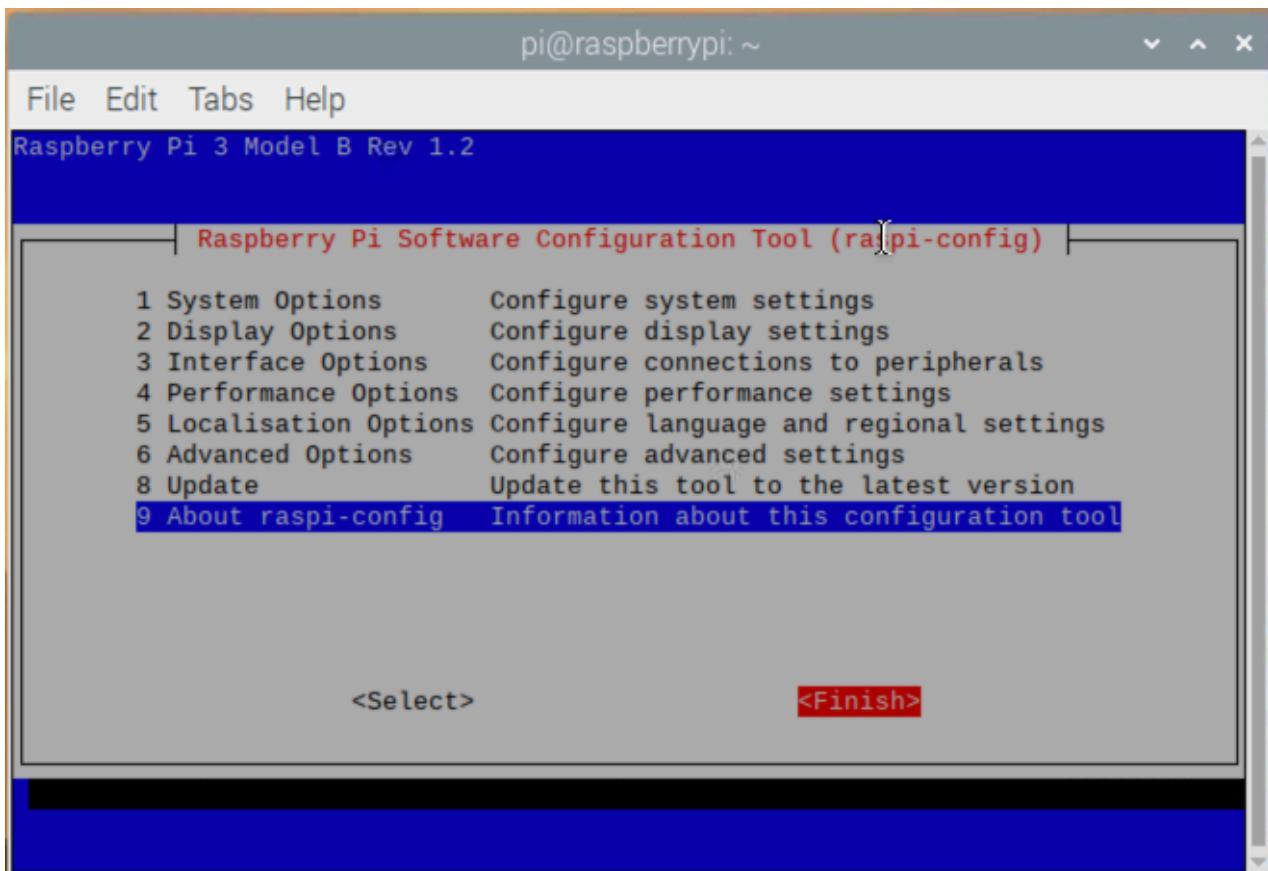
Choose **System Options** and hit enter



Select **S5 Boot / Auto Login** and hit enter.



Select **B3 Desktop** to disable auto-login and hit enter.



You can go back to the main menu and choose ***Finish***

The utility will ask you to reboot which you can do.

Install Docker

Next we will install docker and get it running. Docker is like a system for controlling small processes. Think of a wall of pigeon holes:



Each tool has it's own place.. You go to the hole and get the tool you need for a particular task. Well docker is the pigeonhole cabinet, and the tools are the components we need, like a web server, database server, app server.

The alternative is having all the tools on your desk... It still works but sometimes the tools get in the way of each other.

So, open up your favourite SSH client and connect to the rPi.

- Putty is good and simple - <https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>
- MobaXTerm is also excellent and includes file/transfer software built in - <https://mobaxterm.mobatek.net/>
- If you are on a Mac, you can run ssh directly from the terminal.

Docker's instructions for installing Docker are here: <https://www.docker.com/blog/getting-started-with-docker-for-arm-on-linux/>

I've copied them for this document.

First off, run the update/upgrade commands.

```
pi@flightline:~$ sudo apt-get update
Get:1 http://archive.raspberrypi.org/debian buster InRelease [32.9 kB]
Get:2 http://archive.raspberrypi.org/debian buster/main armhf Packages [367 kB]
Get:3 http://raspbian.raspberrypi.org/raspbian buster InRelease [15.0 kB]
Get:4 http://raspbian.raspberrypi.org/raspbian buster/main armhf Packages [13.0
MB]
Get:5 http://raspbian.raspberrypi.org/raspbian buster/non-free armhf Packages
[104 kB]
```

```

Fetched 13.5 MB in 38s (358 kB/s)
Reading package lists... Done

pi@flightline:~$ sudo apt-get upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following packages will be upgraded:
  agnistics base-files bind9-host bluez-firmware ca-certificates
  chromium-browser chromium-browser-110n chromium-codecs-ffmpeg-extra device-
tree-compiler
  file firmware-atheros firmware-brcm80211 firmware-libertas firmware-misc-
nonfree
  firmware-realtek gstreamer1.0-plugins-bad iproute2 libbind9-161
  libblockdev-fs2 libblockdev-loop2 libblockdev-part-err2 libblockdev-part2
  libblockdev-swap2 libblockdev-utils2 libblockdev2 libdns-export1104
libdns1104
  libgnutls30 libgstreamer-plugins-bad1.0-0 libisc-export1100 libisc1100
  libisccc161 libisccfg163 libjavascriptcoregtk-4.0-18 libldap-2.4-2 libldap-
common
  liblwres161 libmagic-mgc libmagic1 libpam-systemd libraspberrypi-bin
  libraspberrypi-dev libraspberrypi-doc libraspberrypi0 libsnmp-base libsnmp30
  libssl1.1 libsystemd0 libtiff5 libudev1 libvlc-bin libvlc5 libvlccore9
  libwebkit2gtk-4.0-37 libzstd1 lxplug-bluetooth lxplug-volumepulse openssl
pcmanfm
  piclone piwiz pprompt python-rpi.gpio python3-pygments python3-rpi.gpio
  raspberrypi-bootloader raspberrypi-kernel raspberrypi-sys-mods raspi-config
  rc-gui rp-prefapps rpi-chromium-mods rpi-eeprom rpi.gpio-common sudo
  systemd systemd-sysv thonny tzdata udev unzip vlc vlc-bin vlc-data vlc-110n
  vlc-plugin-base vlc-plugin-notify vlc-plugin-qt vlc-plugin-samba vlc-plugin-
skins2
  vlc-plugin-video-output vlc-plugin-video-splitter
  vlc-plugin-visualization xserver-common xserver-xorg-core
95 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 300 MB of archives.
After this operation, 13.5 MB of additional disk space will be used.
Do you want to continue? [Y/n]

```

Hit Y then enter. It will take a few minutes, grab a coffee.

```

Get:1 http://archive.raspberrypi.org/debian buster/main armhf xserver-common
all 2:1.20.4-1 [2,235 kB]
Get:2 http://mirror.internode.on.net/pub/raspbian/raspbian buster/main armhf
base-files armhf 10.3 [70.1 kB]
.
.
.

```

```
Get:93 http://archive.raspberrypi.org/debian buster/main armhf vlc-plugin-samba  
armhf 3.0.12-0 [127 kB]  
Get:94 http://archive.raspberrypi.org/debian buster/main armhf vlc-plugin-  
video-splitter armhf 3.0.12 [140 kB]  
Get:95 http://archive.raspberrypi.org/debian buster/main armhf vlc-plugin-  
visualization armhf 3.0.12 [142 kB]  
Fetched 300 MB in 10min 17s (485 kB/s)  
Reading changelogs...  
. . .  
Processing triggers for ca-certificates (20200601~deb10u2) ...  
Updating certificates in /etc/ssl/certs...  
0 added, 0 removed; done.  
Running hooks in /etc/ca-certificates/update.d...  
done.  
Processing triggers for libvlc-bin:armhf (3.0.12-0+deb10u1+rpt1) ...  
pi@flightline:~$
```

It's important, after a kernel upgrade, to reboot the rPi. Otherwise you will get an error when Docker starts up and tries to use iptables.

```
pi@flightline:~$ sudo reboot
```

Next, download the docker installer.

```
pi@flightline:~$ curl -fsSL test.docker.com -o get-docker.sh && sh get-  
docker.sh  
  
blah blah missing the output of these commands...
```

Finally, add the pi user to the list of users who can execute docker commands.

```
pi@flightline:~ $ sudo usermod -aG docker pi
```

Make sure you log out and log in again for this to take effect.

Docker should now be installed. You can test in the following way:

```
pi@flightline:~ $ docker run --rm hello-world  
Unable to find image 'hello-world:latest' locally  
latest: Pulling from library/hello-world  
4ee5c797bcd7: Pull complete  
Digest: sha256:308866a43596e83578c7dfa15e27a73011bdd402185a84c5cd7f32a88b501a24  
Status: Downloaded newer image for hello-world:latest  
  
Hello from Docker!
```

This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:

1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
(arm32v7)
3. The Docker daemon created a new container from that image which runs the executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it to your terminal.

To try something more ambitious, you can run an Ubuntu container with:

```
$ docker run -it ubuntu bash
```

Share images, automate workflows, and more with a free Docker ID:

```
https://hub.docker.com/
```

For more examples and ideas, visit:

```
https://docs.docker.com/get-started/
```

We will also need docker-compose, a helper script for Docker. Be sure to answer 'y' when asked if you want to continue.

```
pi@flightline:~# sudo apt-get install docker-compose
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  cgroupfs-mount golang-docker-credential-helpers python3-cached-property
  python3-docker
  python3-dockererpyt python3-dockerpycreds python3-docopt python3-jsonschema
  python3-texttable
  python3-websocket python3-yaml
Suggested packages:
  python-jsonschema-doc
Recommended packages:
  docker.io
The following NEW packages will be installed:
  cgroupfs-mount docker-compose golang-docker-credential-helpers python3-
  cached-property
  python3-docker python3-dockererpyt python3-dockerpycreds python3-docopt
  python3-jsonschema
  python3-texttable python3-websocket python3-yaml
0 upgraded, 12 newly installed, 0 to remove and 0 not upgraded.
Need to get 915 kB of archives.
After this operation, 3,774 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

```
Get:1 http://mirror.internode.on.net/pub/raspbian/raspbian buster/main armhf  
cgroupfs-mount all 1.4 [6,276 B]  
. . .  
Get:11 http://mirror.internode.on.net/pub/raspbian/raspbian buster/main armhf  
python3-yaml armhf 3.13-2 [111 kB]  
Get:12 http://mirror.internode.on.net/pub/raspbian/raspbian buster/main armhf  
docker-compose all 1.21.0-3 [108 kB]  
Fetched 915 kB in 10s (88.6 kB/s)  
Selecting previously unselected package cgroupfs-mount.  
(Reading database ... 98843 files and directories currently installed.)  
Preparing to unpack .../00-cgroupfs-mount_1.4_all.deb ...  
Unpacking cgroupfs-mount (1.4) ...  
Selecting previously unselected package python3-cached-property.  
. . .  
Setting up docker-compose (1.21.0-3) ...  
Processing triggers for man-db (2.8.5-2) ...  
Processing triggers for systemd (241-7~deb10u6+rpi1) ...
```