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RASPBERRY PI - GETTING STARTED

A Python class for my Mechatronics Engineering @ SVCTE.

Last Updated: Sunday, January 27, 2019

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Objective, Overview & Introduction

- Linux is the Operating System that the Raspberry Pi typically uses. This lecture will introduce Linux, the Raspbian Desktop and some useful Linux commands

1. You will navigate and update the Raspbian OS
2. You will learn how to make additional updates and add applications to your OS

These slides are an adaption, and companion to the book by Simon Monk "Programming the Raspberry Pi – getting Started with Python". Created to better target my SVCTE High School Mechatronics Engineering class.

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RESOURCES & MATERIALS NEEDED

- Simon Monks “Programming the Raspberry Pi – Getting Started with Python”
- PC or Laptop
- Access to the Internet
- A Raspberry Pi 3 rev2 or better
- Display (DVI/HDMI) and Keyboard and Mouse

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WHAT YOU WILL KNOW…

- Prior Knowledge & Certifications
  - You don’t need to have an prior Programming or Raspberry P
  - Coding experience is helpful, but not required…

- What You Will Know & Be Able To Do
- You will navigate and update the Raspbian OS
- You will learn how to make additional updates and add applications to your OS

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How will you be measured

- At the end of this lesson, you be introduced and use some Linux command line commands
- You will be measured by how well you have followed the lab instructions, and been able to get your hardware working
- How will success be determined? You will be able to update a new screen capture app, and take turn in a screen capture of your Pi desktop

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New words or concepts...

- Linux
- GNU GPL
- sudo
- apt-get

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LET'S JUMP INTO LINUX

We are going to learn some Linux Command Line commands

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History of Linux

- **Linux** began in 1991 with the commencement of a personal project by Finnish student Linus Torvalds to create a new free operating system kernel
- Open Source, distributed under the GNU GPL
- YouTube – **The Story of Linux**

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LAB & QUIZ

- Read Chapter 2 “Getting Started”
  - Plan on about 15 min
- Take Chapter 2 Quiz
- If you get done early do some more research on Linux command lines
  - You may want to ask me before you install something…

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TAKE A DEEP BREATH...

We are about to learn some more about command line & apt-get

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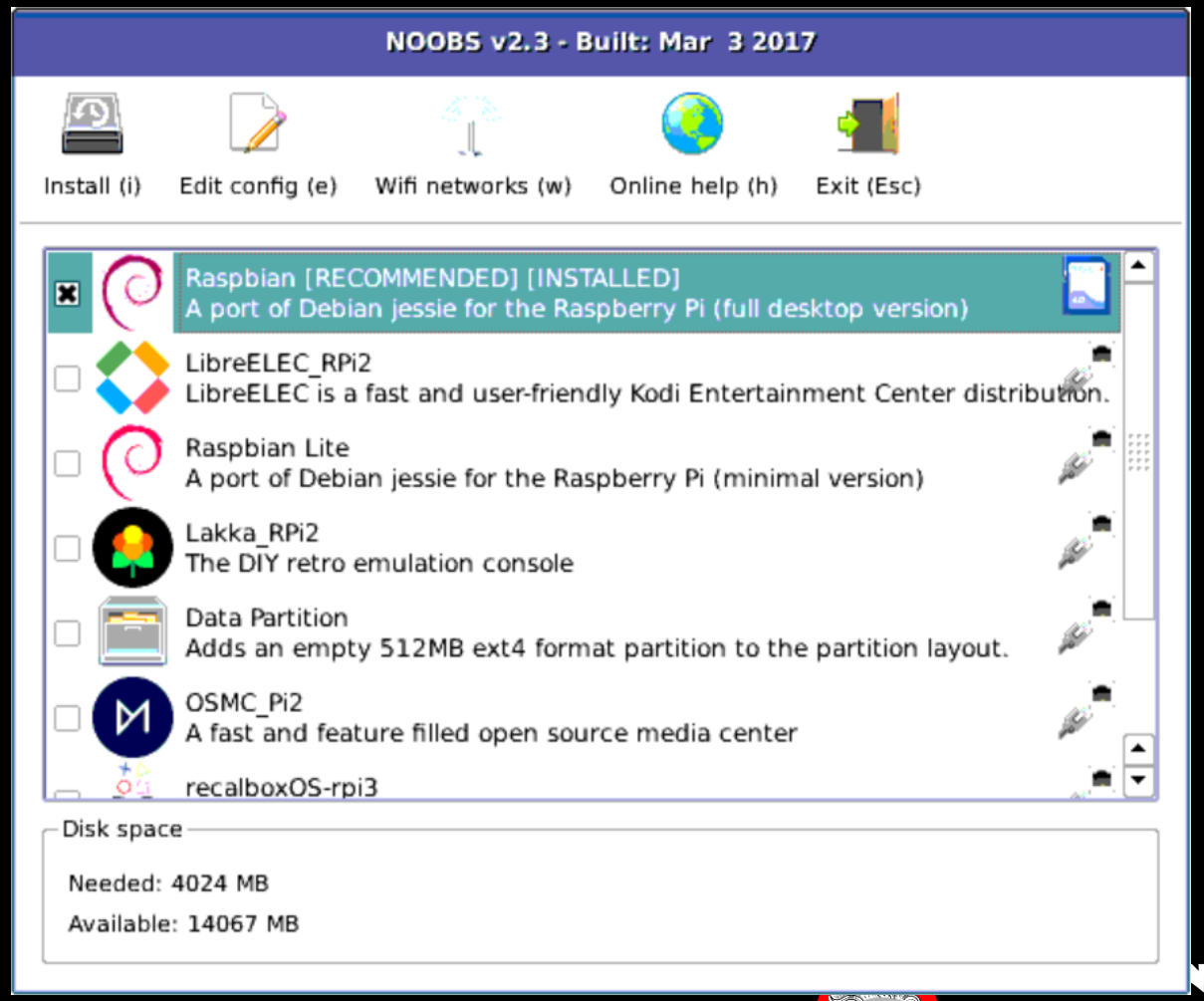
Remember there are lots of Linux images you can install on a Raspberry Pi

- There may be reasons to install a different Linux
- Ha Ha… You can even install Windows 10
- There is even Dual Boot options…



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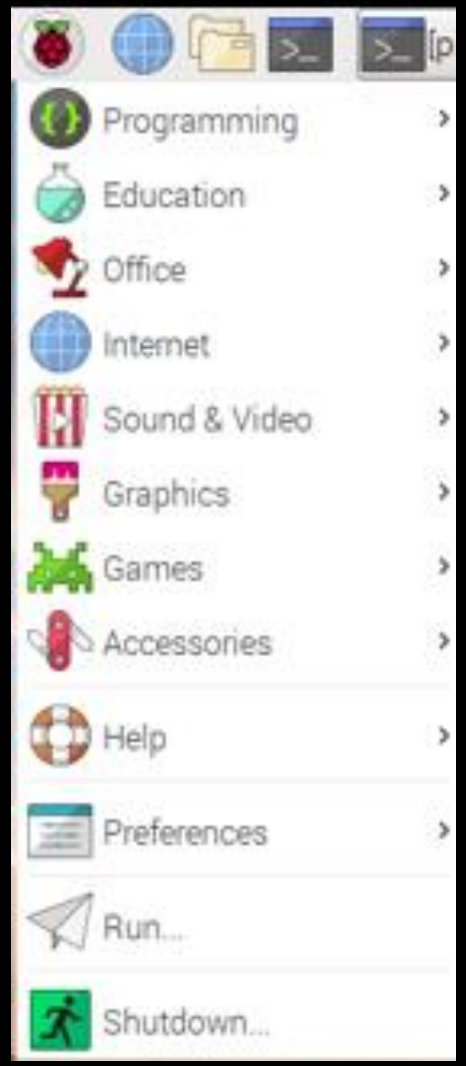
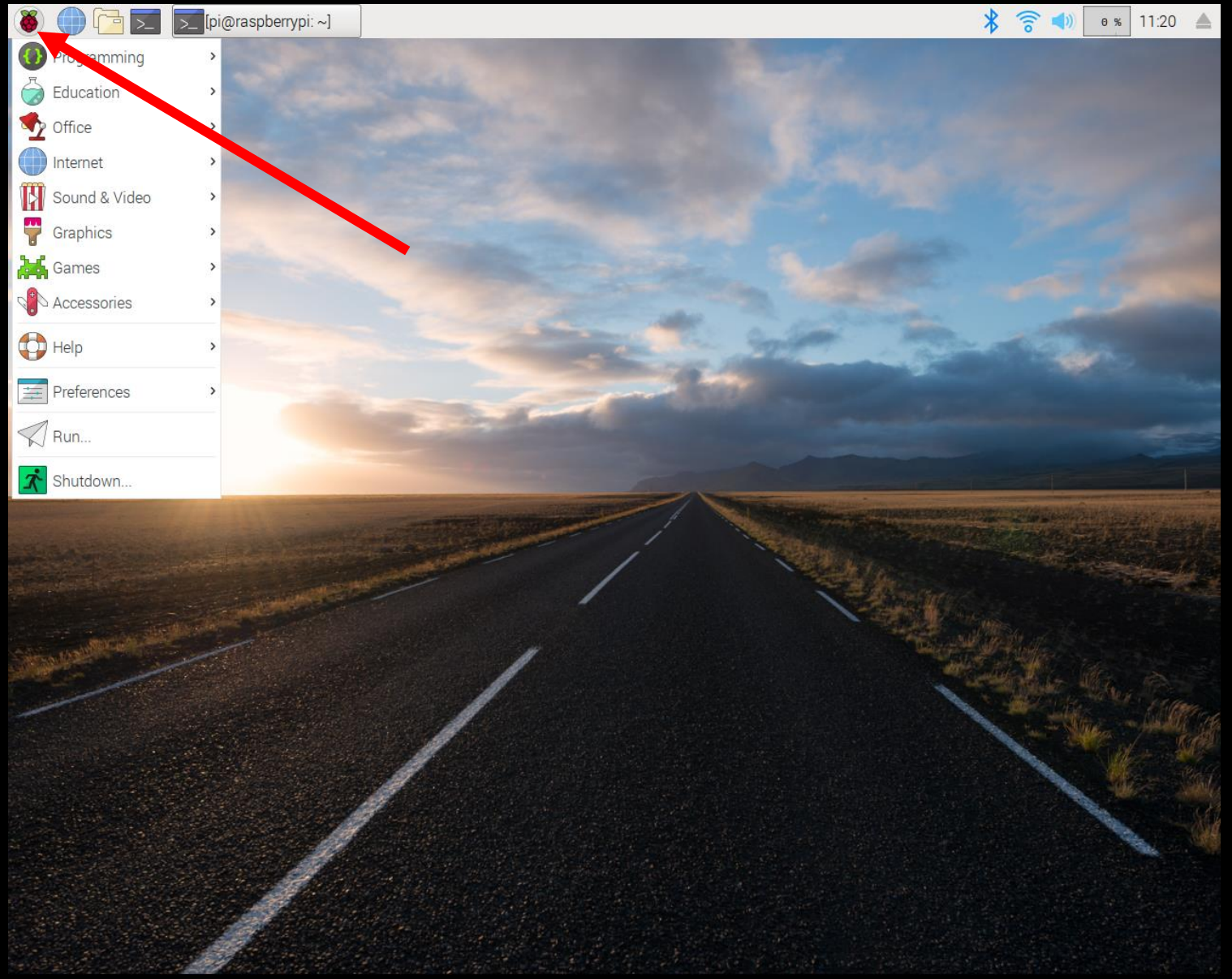
DESK TOP

- Let's Explore





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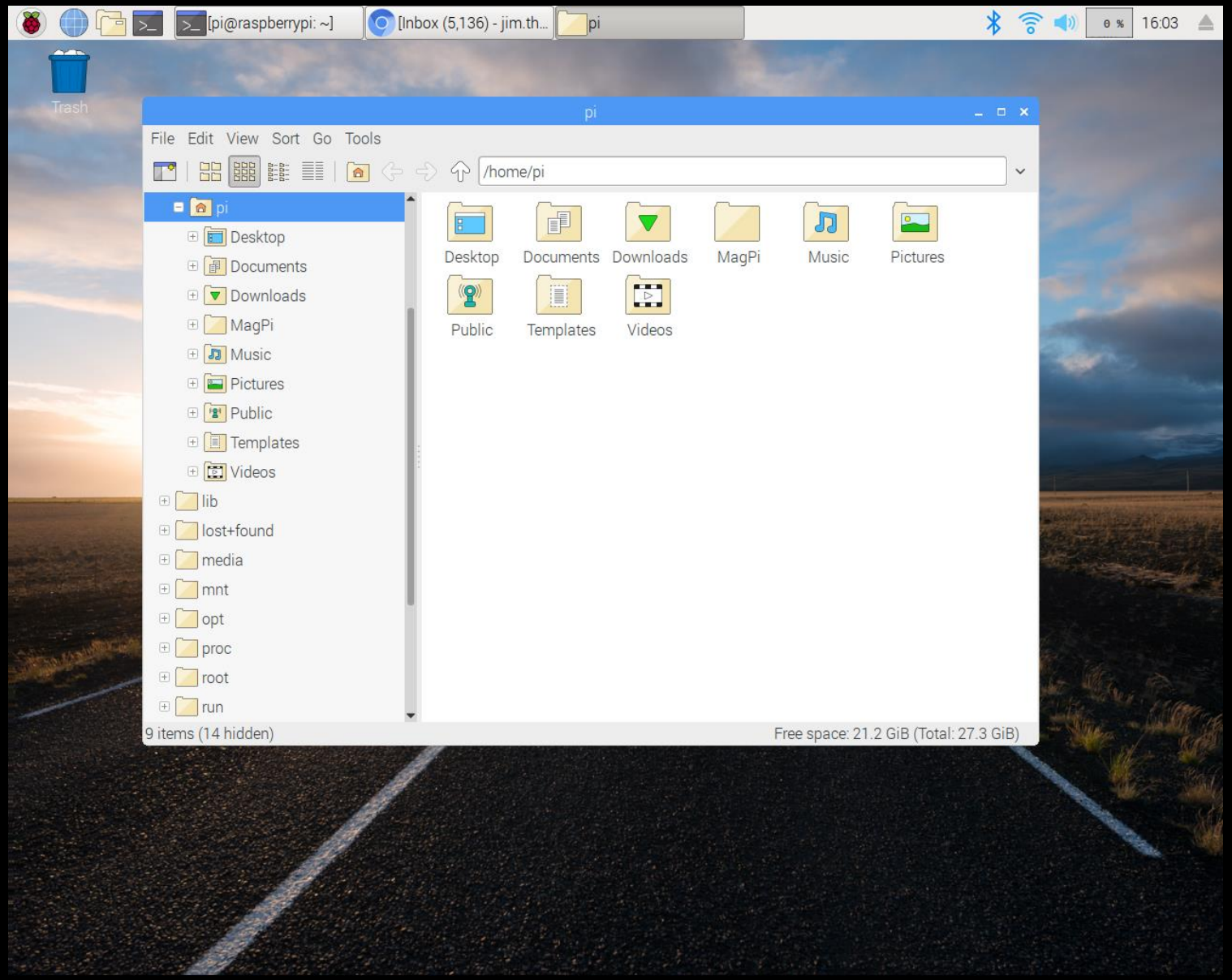
FILE MANAGER

- Let's Explore



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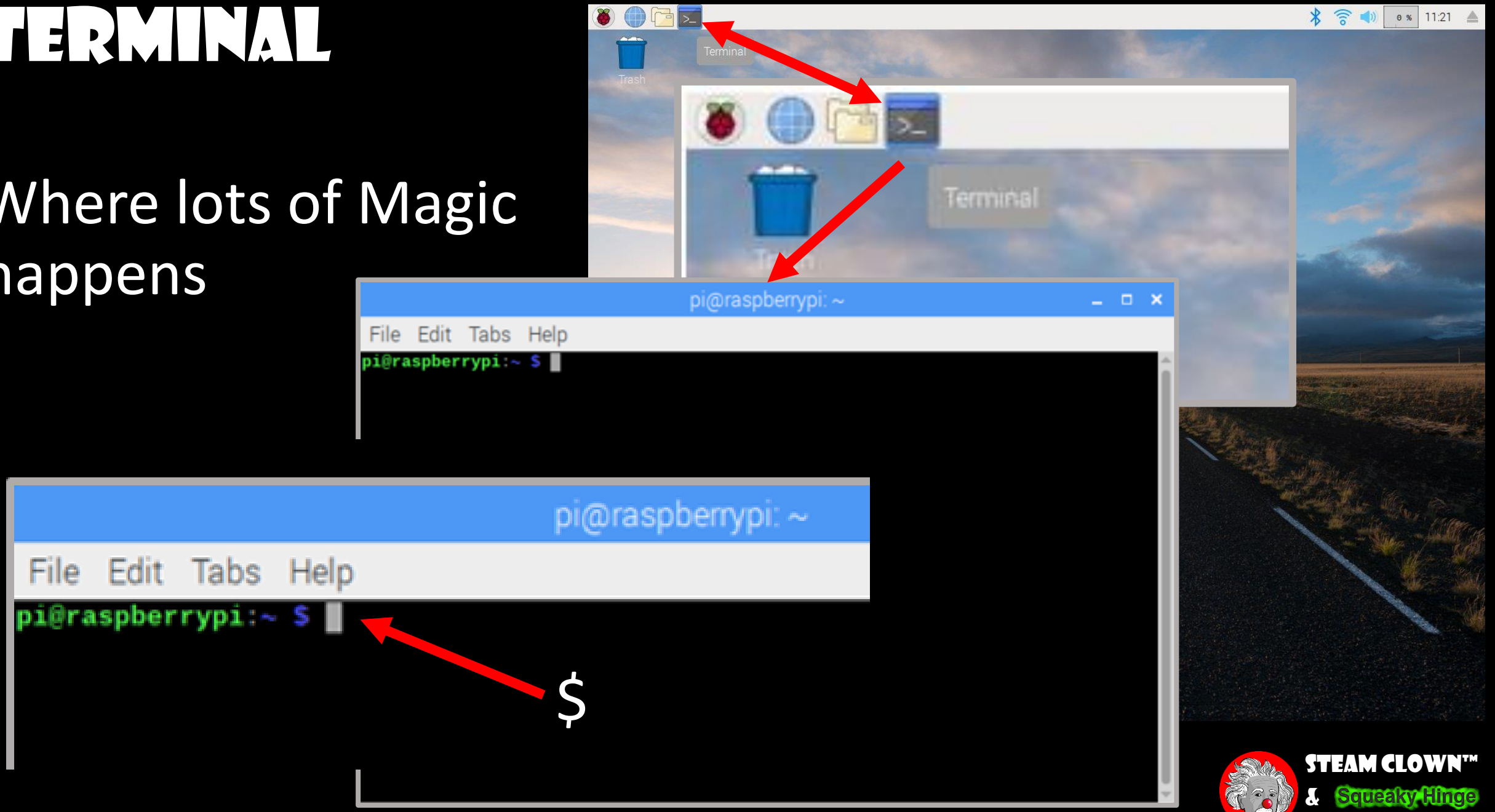
TERMINAL

Where lots of Magic happens



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Some useful commands

- `pwd`
- `ls`
- `cd`
- `date`
- `cal`
- `clear`
- `cat`
- `man [command]`
- `exit`

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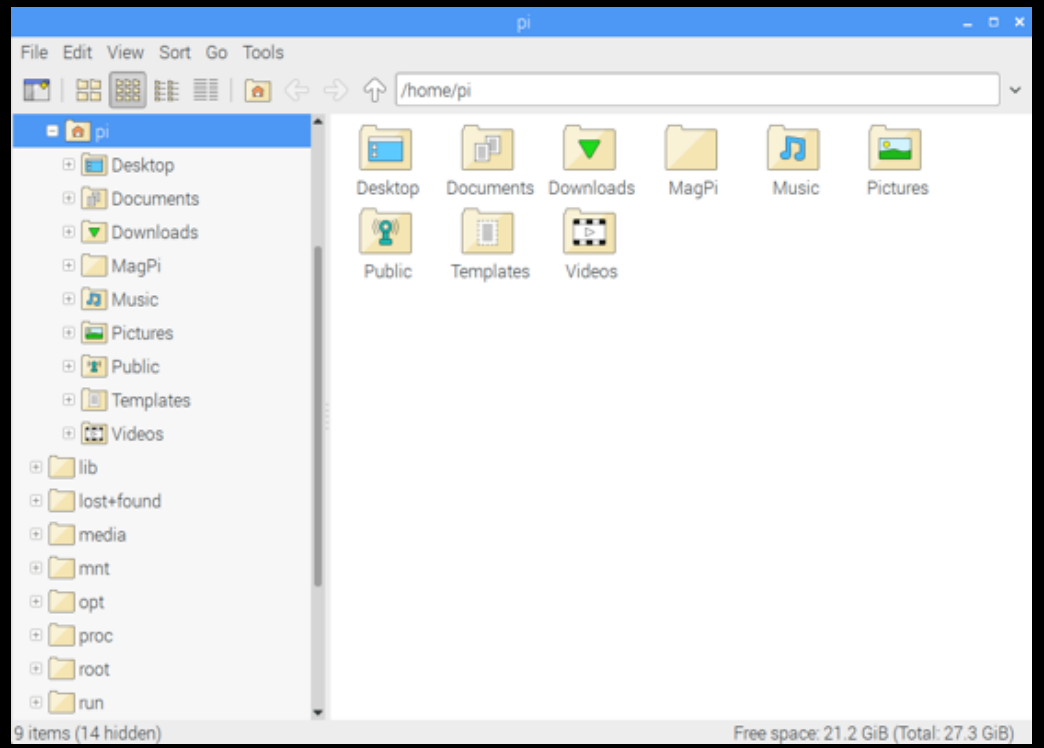
HEY? WHERE AM I?

- How do I find out where I am?

```
~ $ pwd
/home/pi
~ $
```

Print Working Directory



- Since a command line interface is not a graphical picture, it must have a different way of representing it.
- Think of the file system tree as a maze, and you are standing in it
- You can see its files and the pathway to its parent & subdirectories directory
- The directory you are standing in is called the working directory.

http://linuxcommand.org/lc3_lts0020.php

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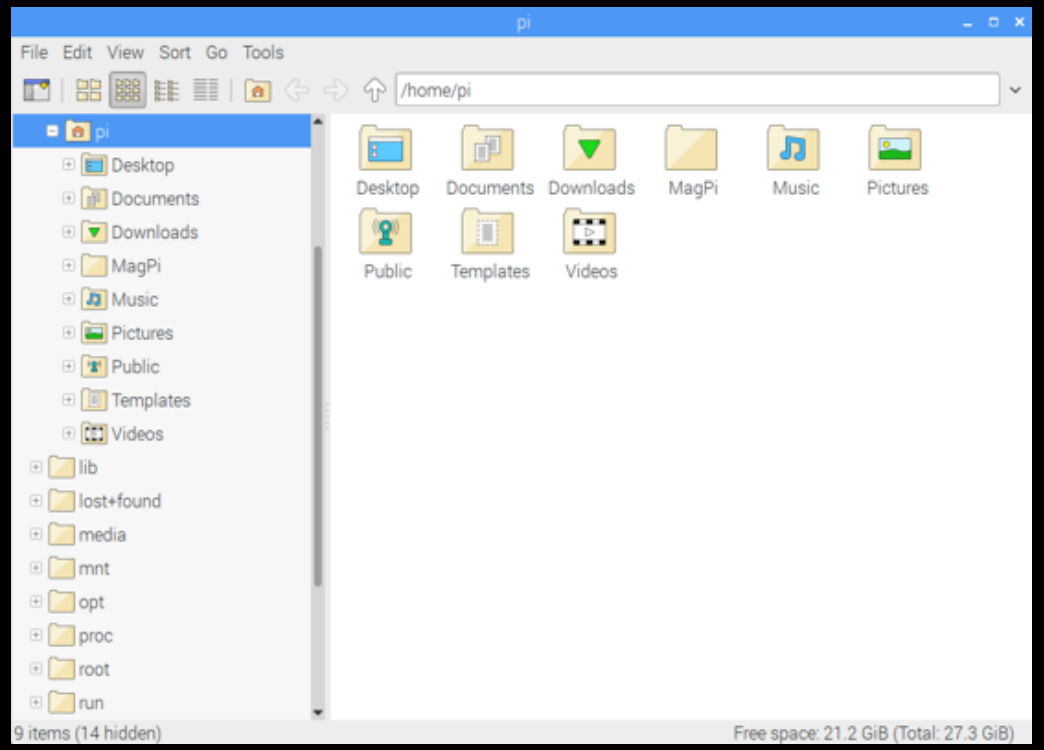
HEY? WHAT IS IN THE DIRECTORY I'M IN?

- How do I find out what files or directories are where I am?

```
~ $ ls
Desktop Downloads Music Public
Videos Documents MagPi Pictures
Templates
~ $
```

List what is in the directory



- With the **ls** command you can see what files or directories are in the directory/folder you are currently in

http://linuxcommand.org/lc3_lts0020.php

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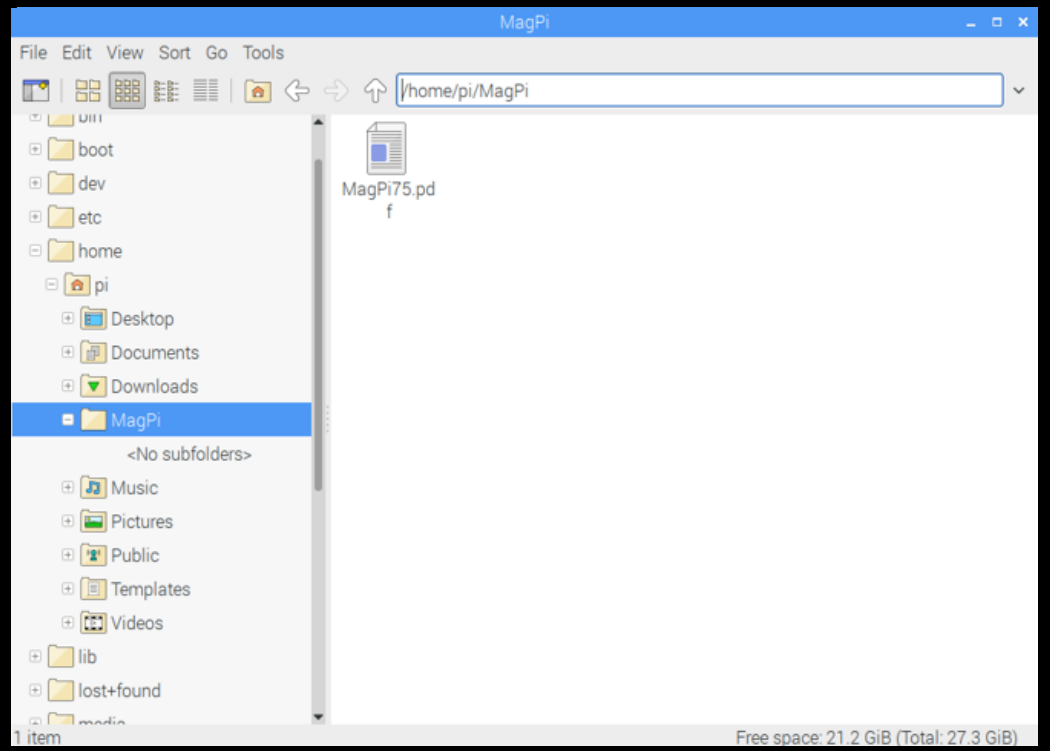
HEY? HOW DO I GET THERE?

- How do I change the directory I'm in?

```
~ $ ls
Desktop Downloads Music Public
Videos Documents MagPi Pictures
Templates
~ $ cd MagPi
~/MagPi $ ls
MagPi75.pdf
~/MagPi $
```

Change Directory



http://linuxcommand.org/lc3_lts0020.php

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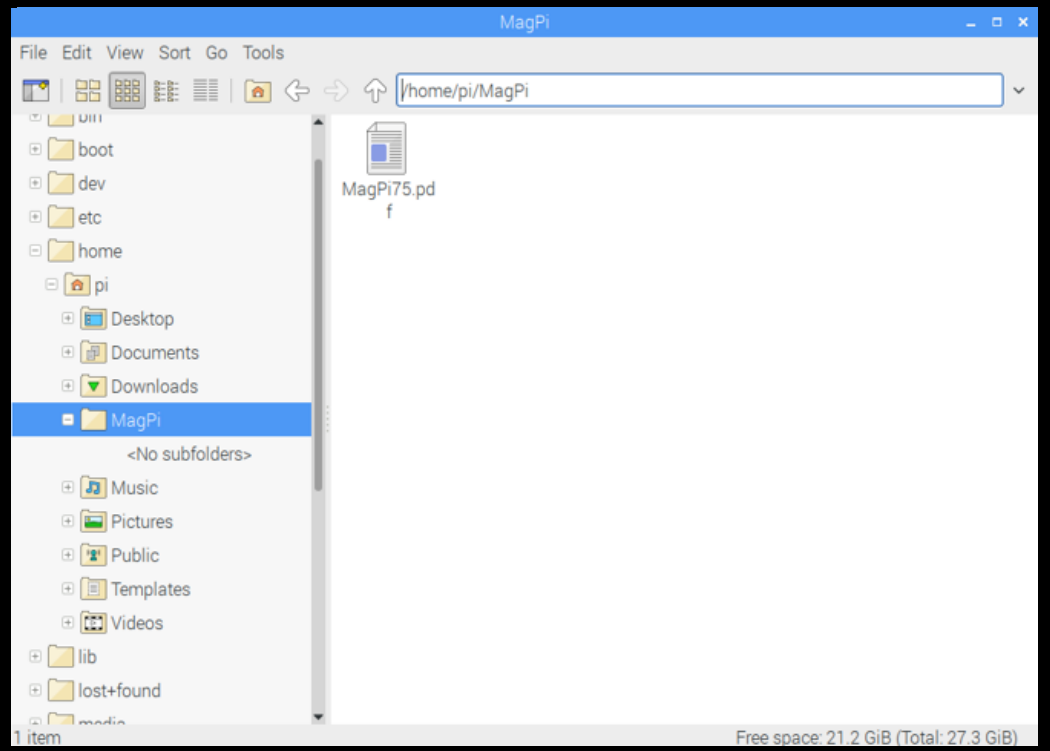
Hey? How do I get back?

- How do I change the directory I'm in?

```
~ $ cd MagPi
~/MagPi $
MagPi75.pdf
~/MagPi $ cd ..
~ $ ls
Desktop Downloads Music Public
Videos Documents MagPi Pictures
Templates
~ $
```

Change Directory with parameters



http://linuxcommand.org/lc3_lts0020.php

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Let's move around...

- Type the following:

```
~ $ cd ..
/home $ cd ..
/ $ ls
```

- what do you see? Where are you?
- Now use the `cd` command to get back to the your Raspberry Pi "user" directory **`/home/pi`**

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Hey, there is a lot on my screen...

```
~ $ clear
```

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Hey, I hate to have to re-type commands…

- Use the ↑ (up arrow) or ↓ (down arrow) to scroll back through previous commands
- Auto-complete ← may not be working
  - Start typing the first or second letters of a command, and then hit Tab

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How to take a screenshot on Raspberry Pi

- Why take a screen shot?
- Introducing "SCROT"
  - **Scrot** is a minimalistic command line screen capturing application. It allows substantial degree of flexibility by specifying parameters on command line.
- How to take a screenshot on Raspberry Pi

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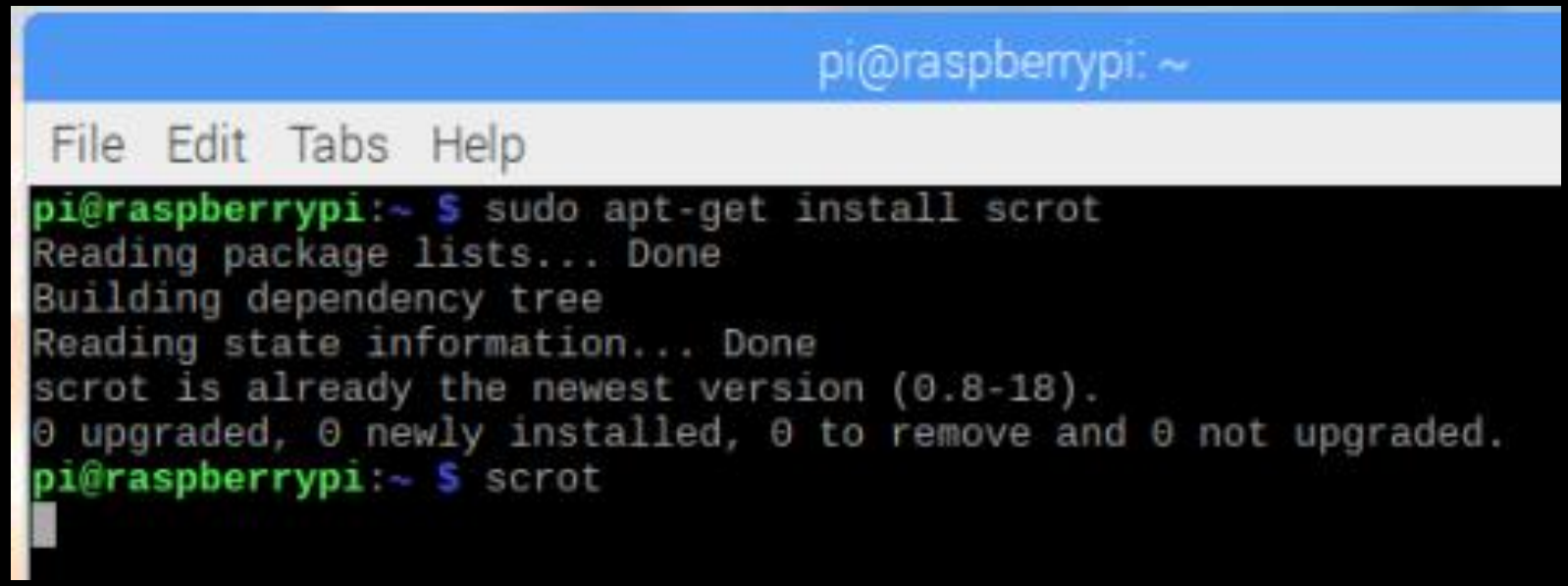
Installing scrot

- Select **Terminal** to open a command window. It is the icon in the upper left corner of the screen that looks like a computer monitor.
- When Terminal opens, type the following command:
  `sudo apt-get install scrot`
- Press **Enter** on the keyboard.



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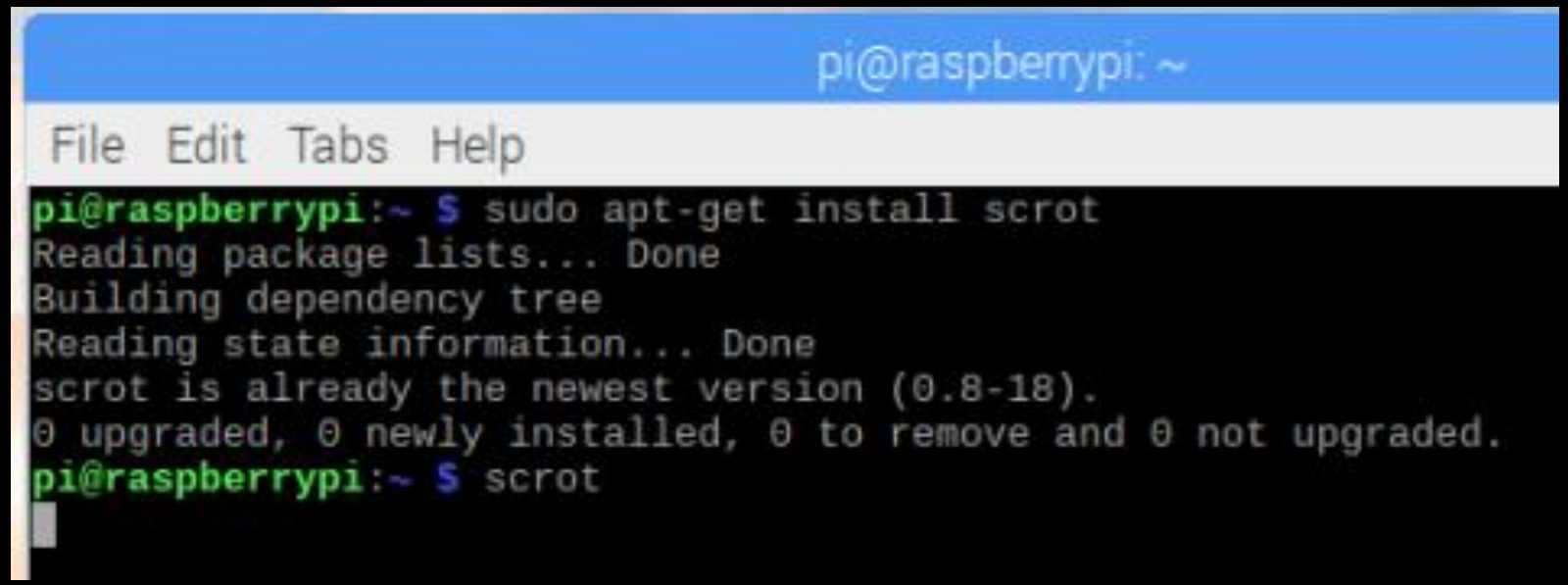
RUNNING SCROT

- After scrot has installed, type the following command:
  `scrot`
- Press **Enter** on the keyboard

- What Happened?



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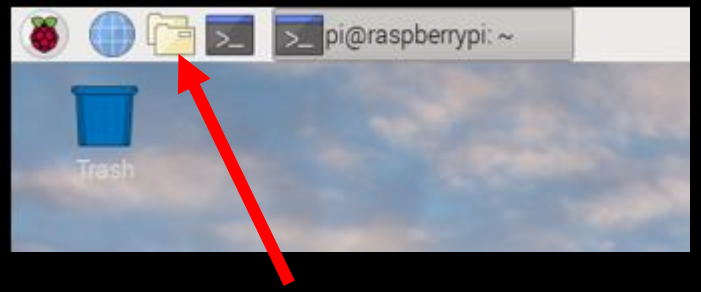
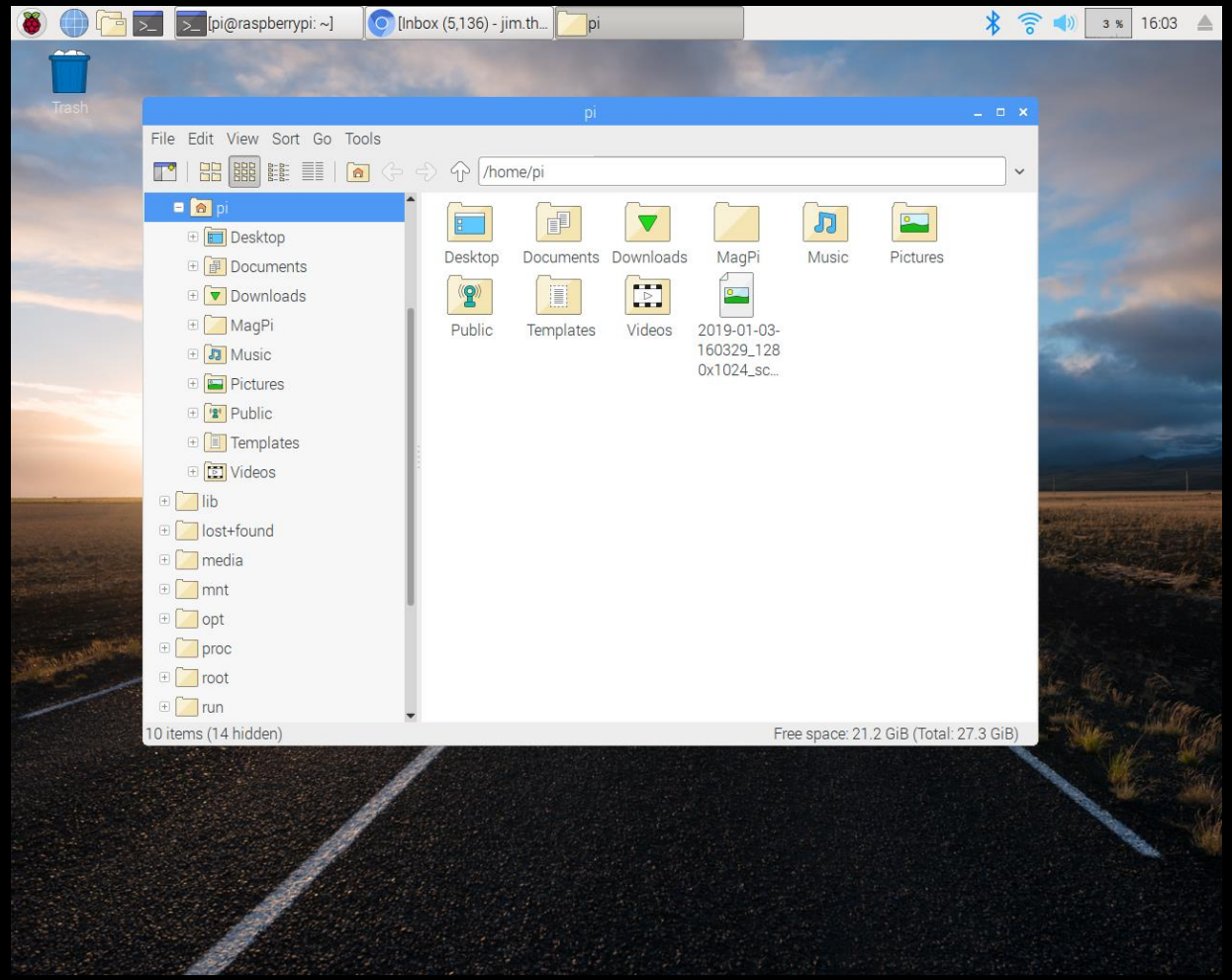
Let's take another look...



- Open the File Manager again
- What is different?
- Click on the thing that is different



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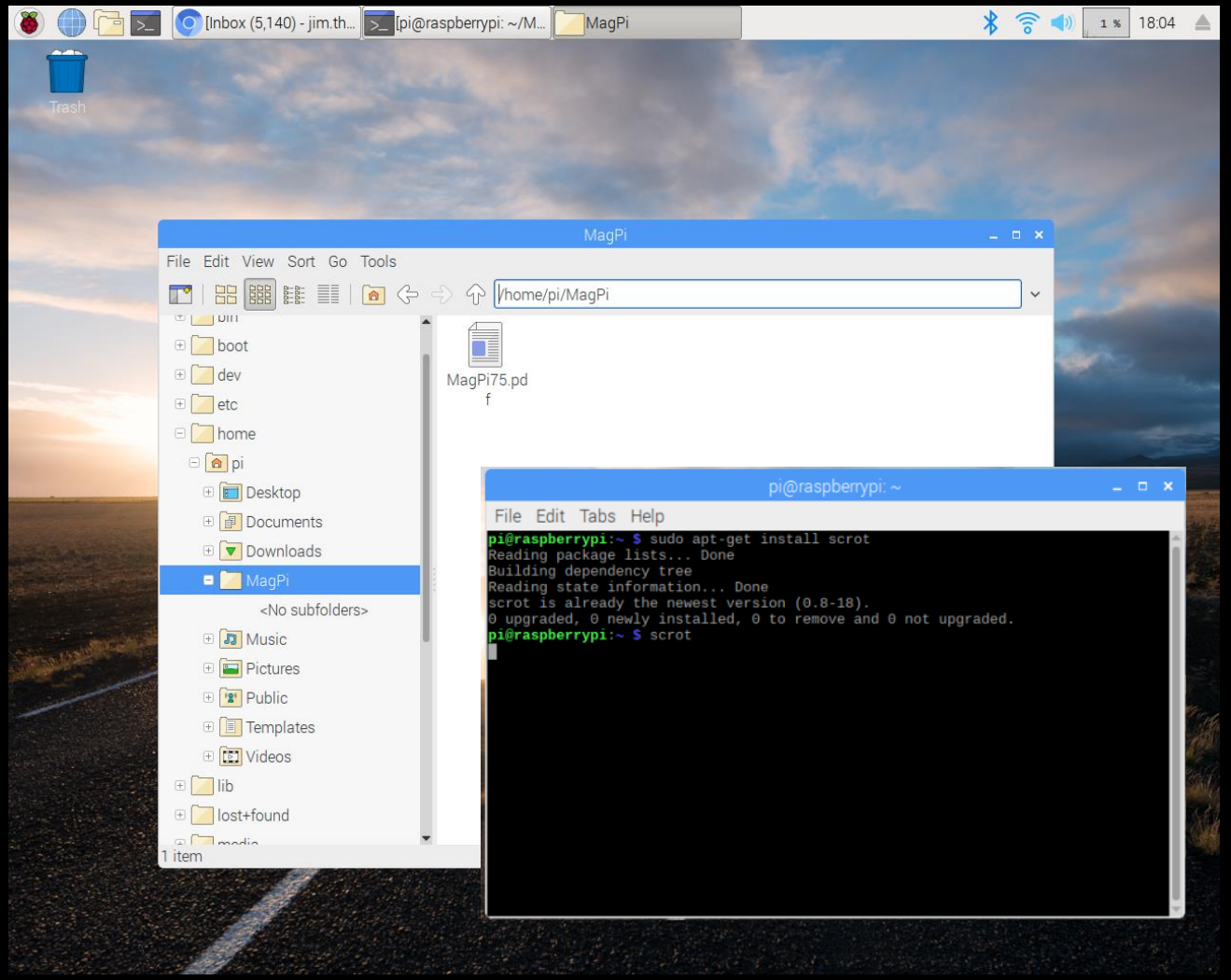
Delay the screen capture

- What about capturing an image with out the console?
- How can you delay?
  - Type:

```
~ $ scrot --h
```

  - Type:

```
~ $ scrot -d 10
```



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Getting Help

- Most commands have a –h or – –h or –help or – – help
  - ~ $ <command><space><-h>

```
~ $ scrot --h
<bunch of help text>
~ $
~ $ ls -help
<bunch of help text>
~ $
```

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man (manual page)

- Most commands have a manual page as well

  ~ $ man <command>

```
~ $ man scrot
<bunch of help text, with "q" to quit>
~ $
~ $ man cd
<bunch of help text, with "q" to quit>
~ $
```

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Play around… Can you screen shot Minecraft?

- Play around with the desktop and menus
- Can you get screen shot of Minecraft?

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REFERENCE SLIDES

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APPENDIX

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Appendix C: Primary Sources & Attribution for Material Used

- Linux Command line tutorial
- iMore tutorial "How to take a screenshot on Raspberry Pi"

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