IOT Lab

Daniel Pivonka

Who am I

- UML Computer Science 2018
- Redhat Associate Software Engineer
- Took this class
- Built personal IOT devices

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- Available to meet with you for help if needed I live near campus just ask

What are we doing

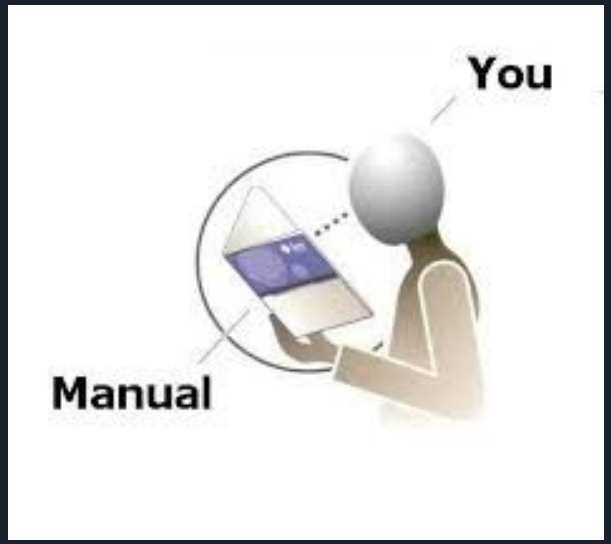
- 6 labs to teach basics of the devices and software we will be using for the project
- Devices: Raspberry pi, ESP8266, various sensors

- Software: mqtt, flask, python, C
- Use what you learn in the six labs to make your own IOT device
- https://github.com/Daniel-Pivonka/iot

Assignment 1

Install fedora on pi and example on esp8266

Setting up Fedora for Raspberry Pi

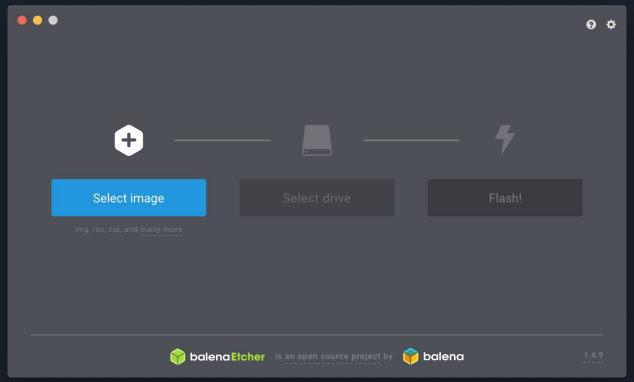


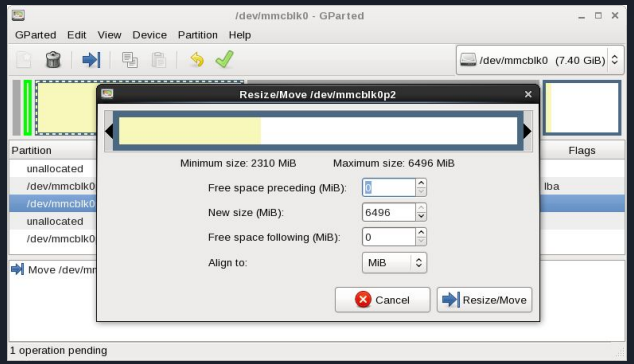
https://fedoraproject.org/wiki/Architectures/ARM/Raspberry_Pi

(google “fedora raspberry pi” first link)

Download Fedora and prepare the sd card

- Recommended Fedora image: Fedora 30minimal aarch64
- Download image to your laptop, insert sd card and, run this command to flash image to sd card
- Preparing the SD card:
- https://www.balena.io/etcher/ (etcher tool to flash sd card)
- Resize the root partition: `gparted /dev/XXX`





Setup and boot Pi

- Plug in sd card, keyboard, mouse, hdmi, ethernet, and power cables

- Follow on screen prompts to set up fedora root password

Note

- The previous 2 slides have been done for you already
- The root password is ‘password’
- PLEASE CHANGE IT!!!!!!!!!!!!!!!!!!!!!!!!!!!!
- I recommend you do the next step over ethernet although it can be done on wifi

Run script

- We have created a script that will install a desktop and browser and some of the software we will need.
- The script is in the class github if you want to look at it
- Run the provided script to setup a desktop environment
- Curl -sL http://rpi.pending.name/setup_script.sh | /bin/bash
- Once the script is done log out (ctrl-d) and log into rpi (password:rpi)
- Run ‘startx’ go through the prompts

More Notes

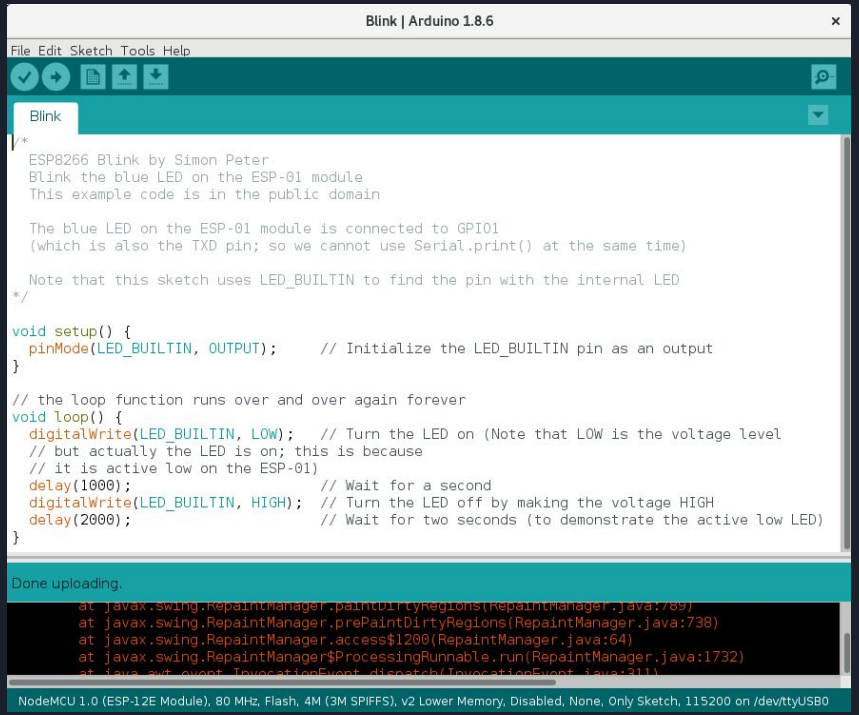
- Used ‘passwd’ to change the rpi user
- password and the root password to something secure
- Additional everytime you boot the pi you will need to log into the rpi user in the terminal then run ‘startx’ to get the desktop to come up
- Connecting to wifi can be done using the commands found in the fedora manual (slide 5)

Setup the esp8266

1. Download the Arduino IDE, the latest version. I suggest doing this on your laptop not the PI (https://www.arduino.cc/en/Main/Software)
2. Install the IDE
3. Set up your Arduino IDE as: Go to File->Preferences and copy the URL below to get the ESP board manager extensions: http://arduino.esp8266.com/stable/package_esp8266com_index.json Placing the http:// before the URL lets the Arduino IDE use it...otherwise it gives you a protocol error.
4. Go to Tools > Board > Board Manager> Type "esp8266" and download the Community esp8266 and install.
5. Set up your chip as:
   Tools -> Board -> NodeMCU 1.0 (ESP-12E Module)
   Tools -> Flash Size -> 4M (3M SPIFFS)
   Tools -> CPU Frequency -> 80 Mhz
   Tools -> Upload Speed -> 921600
   Tools-->Port--> (whatever it is)

Run an example program

- Plug the esp8226 into a usb port using a micro usb cable
- File -> Examples -> ESP8266 -> Blink
- Upload to board
- A red led should blink on the board



Make a video

Take a video of both the pi running fedora and the esp8266 blinking

Email it to me before the start of next class for credit

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