1 Download and Setup RPI

1.1 What you need

1. RPI 3 or RPI Zero W
2. Keyboard + Mouse
3. Separate Laptop
4. Wifi availability
5. SD card
6. Windows/MAC Desktop

1.2 Prepare Installs

1. Install Putty on the desktop
   https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html
2. Install VNC on the desktop
   https://www.realvnc.com/en/connect/download/vnc/raspberrypi/
3. Install SD card Formatter on the desktop
   https://kb.sandisk.com/app/answers/detail/a_id/14827/~/using-sd-formatter-tool-to-restore-full-capacity-on-sdhc%2Fsdxc-cards
4. Install Windows Imager on the desktop
   https://sourceforge.net/projects/win32diskimager/

1.3 OS Setup (May 2018)

1. Download Raspbian Stretch from RPI website to desktop. Can take 10 mins or 1 hour. https://www.raspberrypi.org/downloads/raspbian/ .
2. Extract the file from the zip folder (Raspbian stretch with recommended software)
3. Format SD card (quickformat) using SDFormatter. You can use window's "disk management". Make sure not to reformat good windows disks. Fat 32?
4. Copy the file saved in #1 on to the formatted SD card (#2) using Windows Image writer. Takes 10 mins
5. Insert the SD card into RPI, connect a mouse, Keyboard and a monitor.
6. Desktop of RPI should be Seen

1.4 Configure RPI OS

Go to Preferences in the main menu (icon: Raspberry)

1. Appearance Settings: Move the menu bar to the bottom.
2. Keyboard: Change to US English
3. Raspberry Pi Configuration: Change Hostname, reboot.
   a. Interfaces: enable all: camera, SSH, VNC, SPI, I2c, etc.
4. Localization: Set localizations as needed.

Reboot.

2 MQTT Setup

2.1 Install Mosquitto on RPI

1. http://randomnerdtutorials.com/how-to-install-mosquitto-broker-on-raspberry-pi/

```
$ sudo apt update
$ sudo apt install -y mosquitto mosquitto-clients
$ sudo systemctl enable mosquitto.service
```

2.2 Test Mosquitto

https://randomnerdtutorials.com/testing-mosquitto-broker-and-client-on-raspbbery-pi/

Create one Putty Window#1 and subscribe:

```
$ mosquitto_sub -d -t testTopic
```

Create another Putty window#2 and Publish:

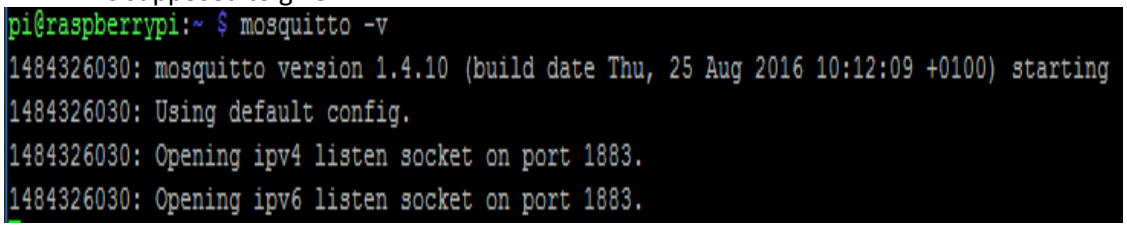
```
$ mosquitto_pub -d -t testTopic -m "Hello world!"
```

You should see it in the Window#2

2.3 Errors in testing

```
$ mosquitto -v
```

Is supposed to give:



But it can give error messages such as: 1484326030: Error: Address already in use". That warning message means that your Mosquitto Broker is already running, so don't worry about that.

3 Node Red Setup

3.1 Installing Node-Red

https://randomnerdtutorials.com/getting-started-with-node-red-on-raspberry-pi/

```
$ bash <(curl -sL
https://raw.githubusercontent.com/node-red/raspbian-deb-package/master/resources/update-nodejs-and-nodered)
```

It will ask some questions and say "Y". Takes a while. Several step install with checks at the end of each step.

```
$ sudo systemctl enable nodered.service
```

```
Sudo reboot
```

3.2 Test Node Red (basic testing).

http://YOUR RPi IP ADDRESS:1880

example: 198.168.1.110:1880

3.3 Setting up the Dashboard nodes

pi@RPIMay2018:~ $ node-red-stop
pi@RPIMay2018:~ $ cd ~/.node-red
pi@RPIMay2018:~ $ npm install node-red-dashboard

takes a little while to finish
Then reboot
pi@RPIMay2018:~ $ sudo reboot

Then go to 192.168.1.110:1880 to create flows
And 192.168.1.110:1880/ui to see the output of the flows executed
Page 50-60 of Home Automation

3.4 Connecting MQTT

Add the MQTT nodes //drag drop?