# Tutorial 1: IoT lessons UNAL

## How to get the module weather sensors working with a Raspberry

### Install the new raspberry:
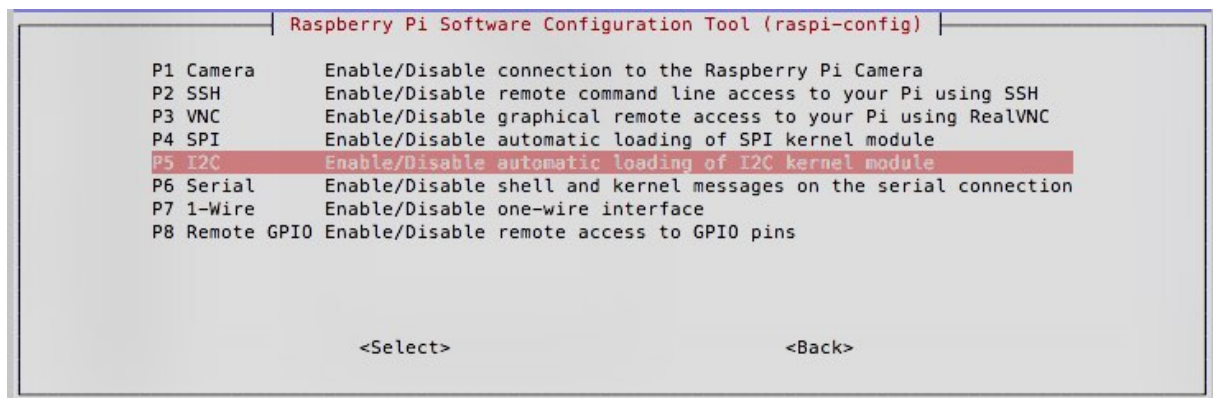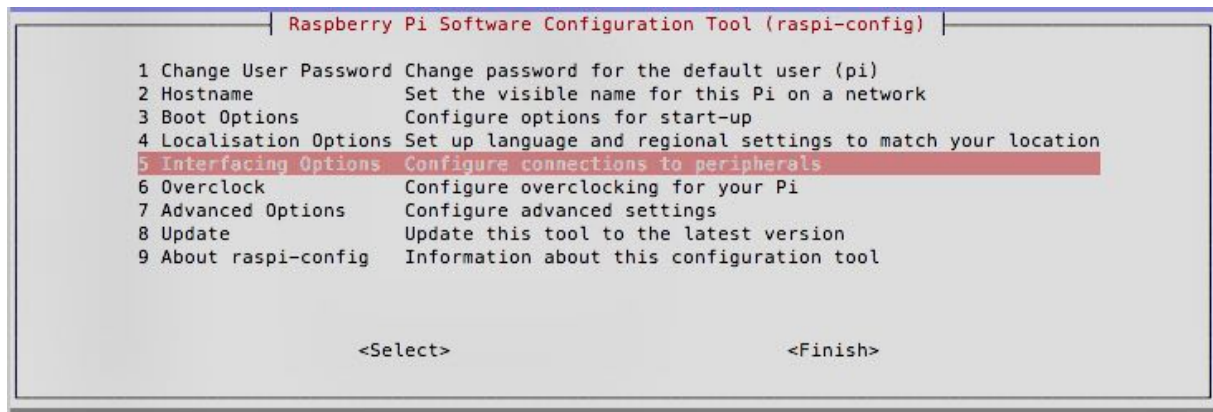
1. Download latest image of raspberry pi:
   https://www.raspberrypi.org/downloads/raspbian/
   You have to download the version Raspbian Stretch Lite from June 2018
2. On the boot partition of the sd card create a file ssh
   `$touch ssh`
3. Configure the WiFi access by modifying the file
   `/etc/wpa_supplicant/wpa_supplicant.conf`
   `# add these lines to the file`

```
network={
    ssid="Unal-Invitados"
}
```

4. Don't forget to give a name to your Raspberry (/etc/hostname), it will be useful to later find the IP address.
   https://www.raspberrypi.org/documentation/remote-access/ip-address.md

### Boot your raspberry

1. Login to your raspberry using SSH and continue the configuration
2. Enable Proxy settings to access UNAL network:
   a. To update the system on /etc/apt/apt.conf
      `Acquire::http::Proxy "http://proxy4.unal.edu.co:8080";`
   b. For docker: https://docs.docker.com/config/daemon/systemd/#httphttps-proxy
   c. System wide proxy /etc/environment
      http_proxy="http://proxy4.unal.edu.co:8080/"
      https_proxy="http://proxy4.unal.edu.co:8080/"
      no_proxy="localhost,127.0.0.1,localaddress,.localdomain.com"
      HTTP_PROXY="http://proxy4.unal.edu.co:8080/"
      HTTPS_PROXY="http://proxy4.unal.edu.co:8080/"

3. Enable i2c access on the raspberry:
   `sudo raspi-config`

```
┤ Raspberry Pi Software Configuration Tool (raspi-config) ├

  1 Change User Password Change password for the default user (pi)
  2 Hostname             Set the visible name for this Pi on a network
  3 Boot Options         Configure options for start-up
  4 Localisation Options Set up language and regional settings to match your location
  5 Interfacing Options  Configure connections to peripherals
  6 Overclock            Configure overclocking for your Pi
  7 Advanced Options     Configure advanced settings
  8 Update               Update this tool to the latest version
  9 About raspi-config   Information about this configuration tool


              <Select>                              <Finish>
```

```
┤ Raspberry Pi Software Configuration Tool (raspi-config) ├

  P1 Camera      Enable/Disable connection to the Raspberry Pi Camera
  P2 SSH         Enable/Disable remote command line access to your Pi using SSH
  P3 VNC         Enable/Disable graphical remote access to your Pi using RealVNC
  P4 SPI         Enable/Disable automatic loading of SPI kernel module
  P5 I2C         Enable/Disable automatic loading of I2C kernel module
  P6 Serial      Enable/Disable shell and kernel messages on the serial connection
  P7 1-Wire      Enable/Disable one-wire interface
  P8 Remote GPIO Enable/Disable remote access to GPIO pins


              <Select>                              <Back>
```

And then reboot
sudo reboot

4.  Install the python libraries for i2c
    sudo apt update
    sudo apt upgrade -y
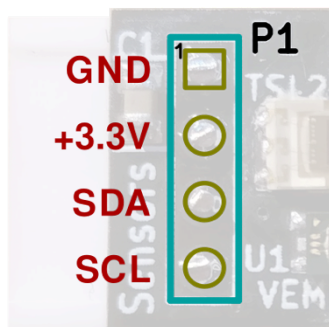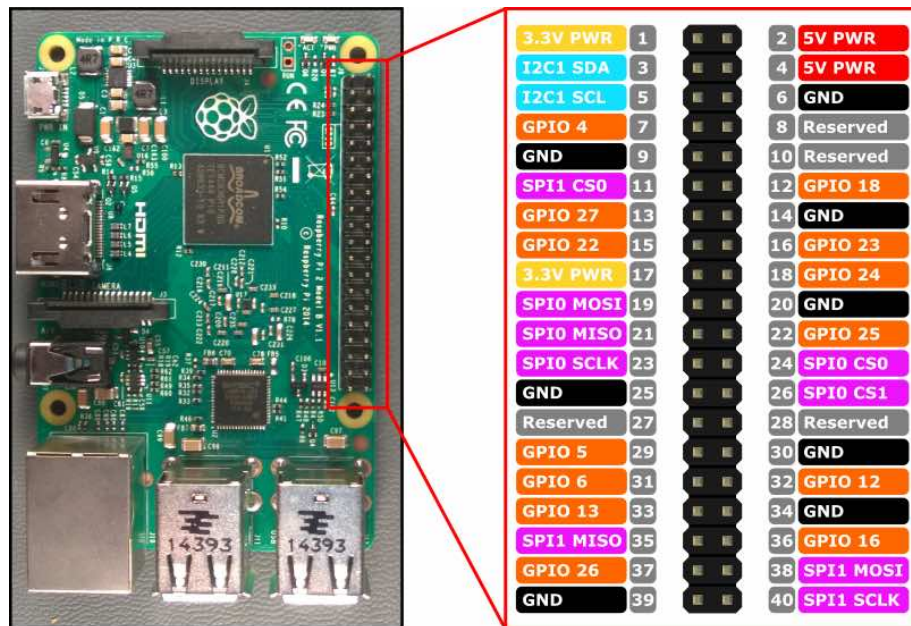    sudo apt-get install -y python-smbus i2c-tools

5.  Verify that the modules for i2c bus are loaded
    lsmod | grep i2c_
    You should see the modules i2c_bcm2835 and i2c_dev

6.  Connect your device to the corresponding pins: Vcc, GND, SDA, SCL

7.  To list the connected devices to the i2c bus:
    ```
    sudo i2cdetect -y 1
    ```

8.  To configure the weather module using python use the libraries on:
    https://github.com/ocrozo/iot-unal