Raspberry Pi

Baking a sensor pi

Installation

- Follow the NOOBS instructions
- Install Rasbian (full desktop)

Coding on the pi

- Visual studio code
  - https://code.headmelted.com/
- Python IDLE
- Command line

Linux

- Terminal commands
  - ls - list
  - cd - change directory
  - mkdir - make directory
  - cp - copy
  - rm - remove
  - cat - concatenate
  - python - a snake!
  - git
    - git clone https://github.com/JohanZackrisson/python-iot-course
  - (no other pets)

Digital Interfaces

- GPIO
- SPI
- I²C
- 1-Wire
- …

Raspberry Pi 3 GPIO Header

Pin#	NAME		NAME	Pin#
01	3.3v DC Power		DC Power 5v	02
03	GPIO02 (SDA1 , I²C)		DC Power 5v	04
05	GPIO03 (SCL1 , I²C)		Ground	06
07	GPIO04 (GPIO_GCLK)		(TXD0) GPIO14	08
09	Ground		(RXD0) GPIO15	10
11	GPIO17 (GPIO_GEN0)		(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)		Ground	14
15	GPIO22 (GPIO_GEN3)		(GPIO_GEN4) GPIO23	16
17	3.3v DC Power		(GPIO_GEN5) GPIO24	18
19	GPIO10 (SPI_MOSI)		Ground	20
21	GPIO09 (SPI_MISO)		(GPIO_GEN6) GPIO25	22
23	GPIO11 (SPI_CLK)		(SPI_CE0_N) GPIO08	24
25	Ground		(SPI_CE1_N) GPIO07	26
27	ID_SD (I²C ID EEPROM)		(I²C ID EEPROM) ID_SC	28
29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38
39	Ground		GPIO21	40

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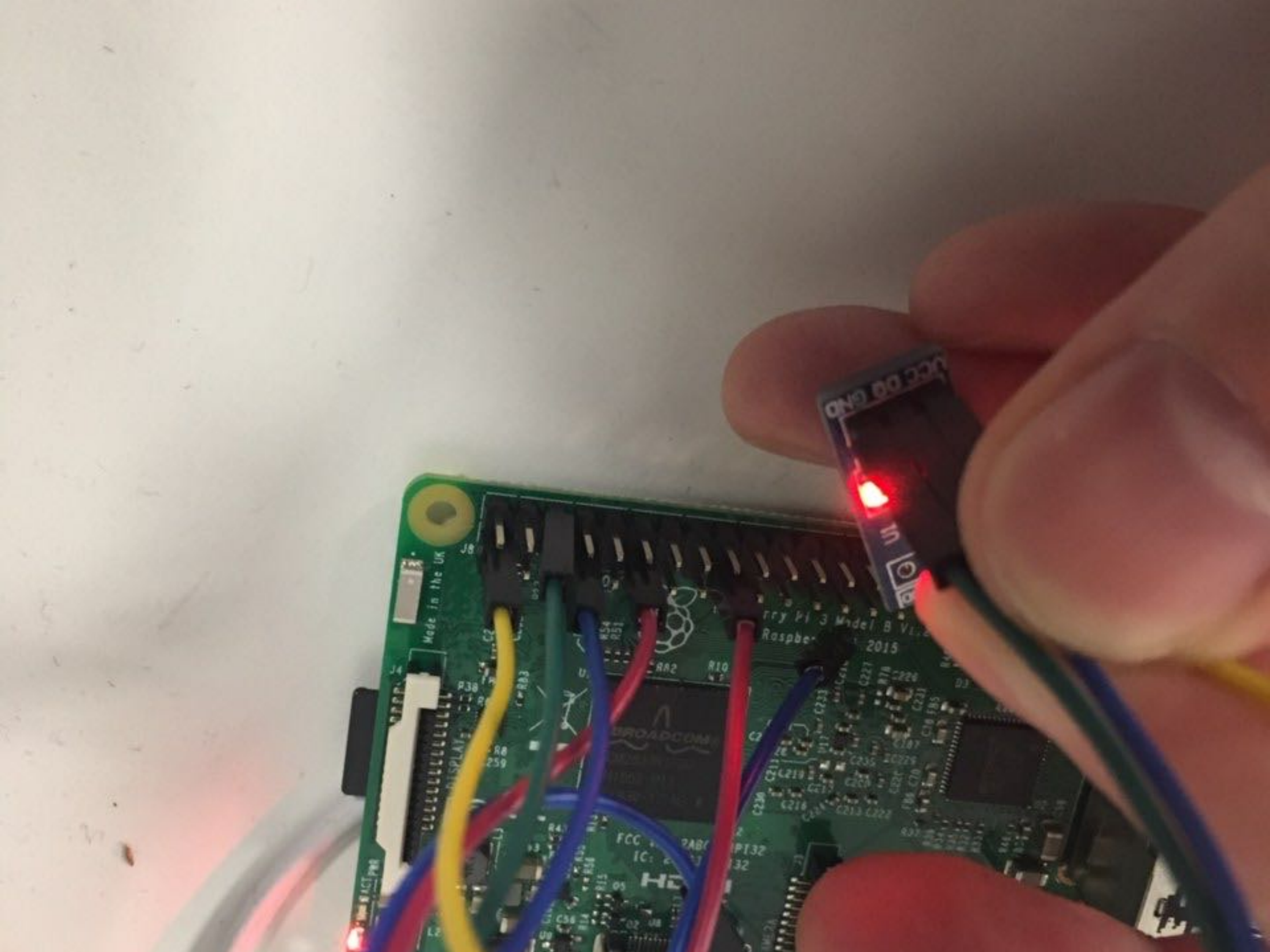
www.element14.com/RaspberryPi


VCC GP GND
Made in the UK
2015

RPi.GPIO

- pip install rpi.gpio
- https://sourceforge.net/p/raspberry-gpio-python/wiki/Inputs/
- Python library for reading and writing to digital pins
    - Configure pin
    - Read or write

- The RPi 3 doesn’t have any analog to digital converters!
    - Arduino?

1-Wire

- What is it?
  - Chainable serial protocol
- Primitive support..
  - Kernel module for thermometers
  - or bit twiddling…
- Enumeration

Linux 1-wire kernel interface

- /sys/bus/w1/devices/
- Lists all detected devices
- Configuration through dtoverlay
  - dtoverlay w1-gpio gpiopin=4 pullup=0
- w1thermsensor
  - does the same

Integration with MQTT

- Check difference between
  - temperatureSensor.py
  - temperatureSensorRPi.py
- Added imports
- Do setup
- Read values