Home Automation with Python on Raspberry Pi

The Raspberry Pi HW & SW

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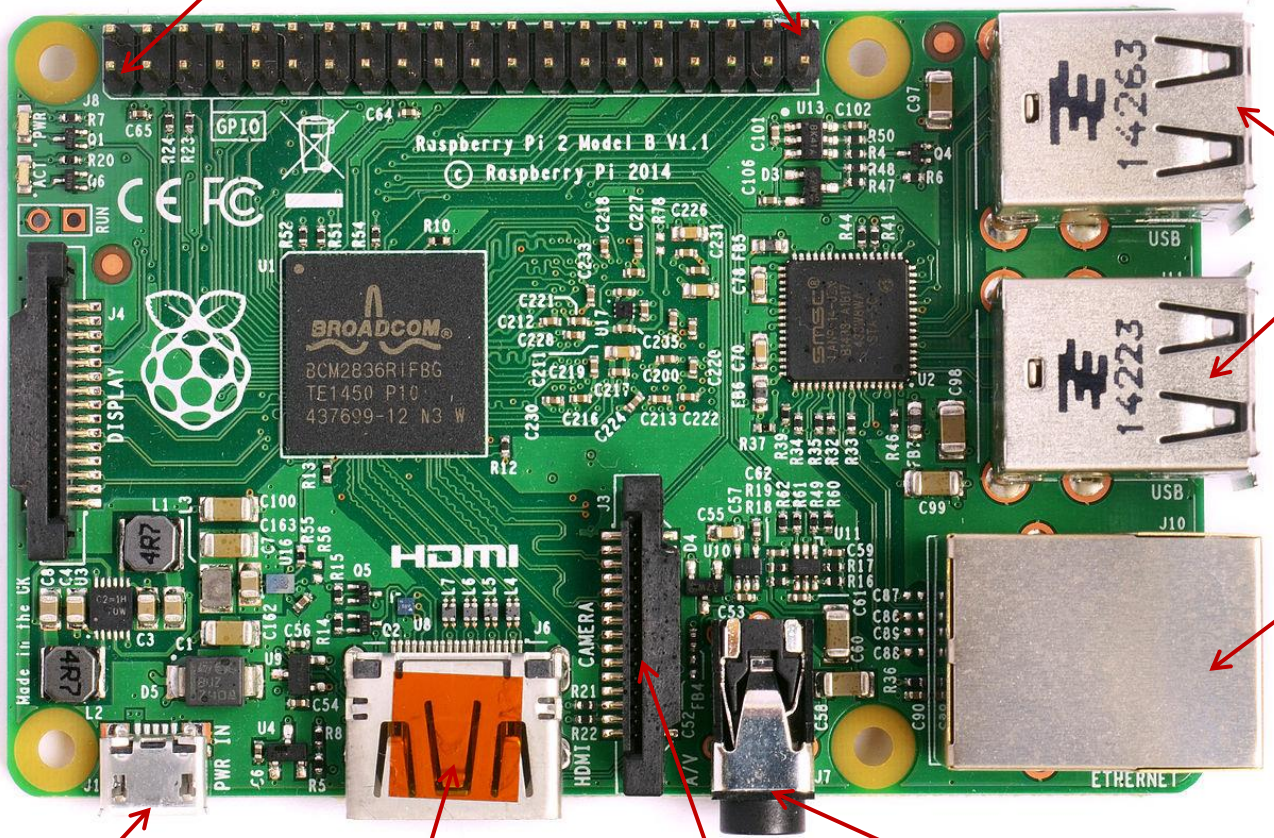
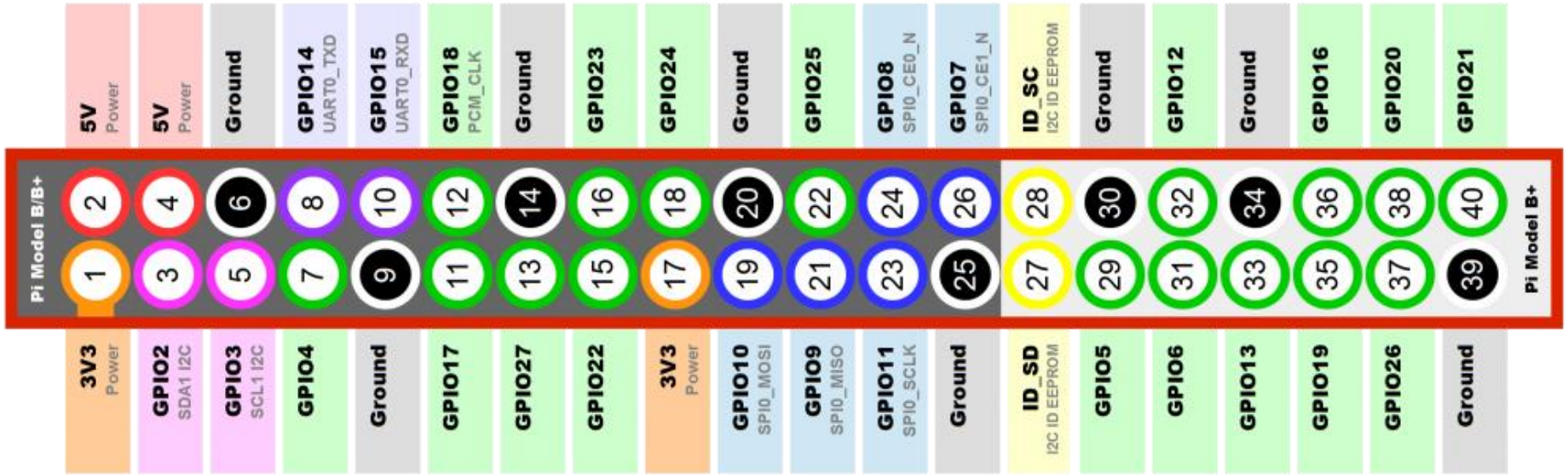
Hardware

- Raspberry Pi 2 Model B 1.1
  - External power supply 5V, 800 mA (max. 4 W)
  - ARM Cortex-A7
  - 4 cores, 900 MHz
  - 1 GB RAM
  - HDMI
  - analog audio out
  - microSD for non-volatile memory
  - 10/100 MBit/s Ethernet
  - 40 pins, thereof 26 GPIO pins

Raspberry Model B



GPIOs



Also see: http://pi.gadgetoid.com/pinout

How to Set Up Linux on the Raspberry

- Download the Rasbian image .img file
  - Debian Linux
  - http://www.raspberrypi.org/downloads/
- Format the SD card
  - With SDFormatter 4.0 for Windows / Mac
  - https://www.sdcard.org/downloads/formatter_4/
- Copy the .img onto the SD card
  - Windows: using the tool win32diskimager
  - http://sourceforge.net/projects/win32diskimager/
- Put the SD card into the Raspberry and boot
  - With monitor connected to HDMI and keyboard & mouse connected to USB
- Configure the system
  - Config tool: `sudo raspi-config`
  - Set user name (pi) and password
  - Expand file system
  - Keyboard layout, language, network settings, …

Installation of necessary SW packages

- Linux advanced packaging tool: `apt`
  - https://wiki.debian.org/Apt
  - Requires root rights, i.e. `sudo apt-…`
  - Updating package list: `apt-get update`
  - Search for packages: `apt-cache search <search string>`
  - Installation of new packages: `apt-get install <name>`
  - Upgrading installed packages: `apt-get upgrade`
- All teams will need to install:
  - apache2
  - mysql-server
  - python-mysqldb
  - python-mod-pywebsocket
- Depending on the peripherials used, other packages are needed
  - python-seriel, libopencv-dev, python-opencv, python-picamera, python-numpy, python-scipy, python-lxml