Understanding the Numbering of the Raspberry-Pi's GPIO Pins for Programming with Python RPi package/module

On a Raspberry Pi, "Broadcom" (BCM) pin numbering refers to the internal GPIO pin numbers on the Broadcom chip, while "Board" pin numbering refers to the physical pin numbers printed on the board header, meaning that while the same physical pin might have different numbers depending on the numbering system you choose, the underlying GPIO function remains the same; BCM is usually preferred for coding consistency across different Raspberry Pi models, while Board numbering might be easier for beginners to understand based on the physical layout.

Key points about the difference:

BCM (Broadcom):

This is the recommended numbering system for most projects, as it refers to the internal GPIO pin numbers on the Broadcom chip, which can vary between Raspberry Pi models.

Board:

This numbering system directly corresponds to the physical pin numbers on the header, making it easier to identify the pin based on its physical location but potentially causing compatibility issues between different Raspberry Pi models.

Example:

- **BCM pin 18:** This refers to a specific GPIO pin on the Broadcom chip.
- **Board pin 12:** This refers to the physical pin labelled "12" on the Raspberry Pi header.

The **GPIO.BOARD** option specifies that you are referring to the pins by the number of the pin on the plug - i.e the numbers printed on the board (e.g. P1) and in the middle of the diagrams below.

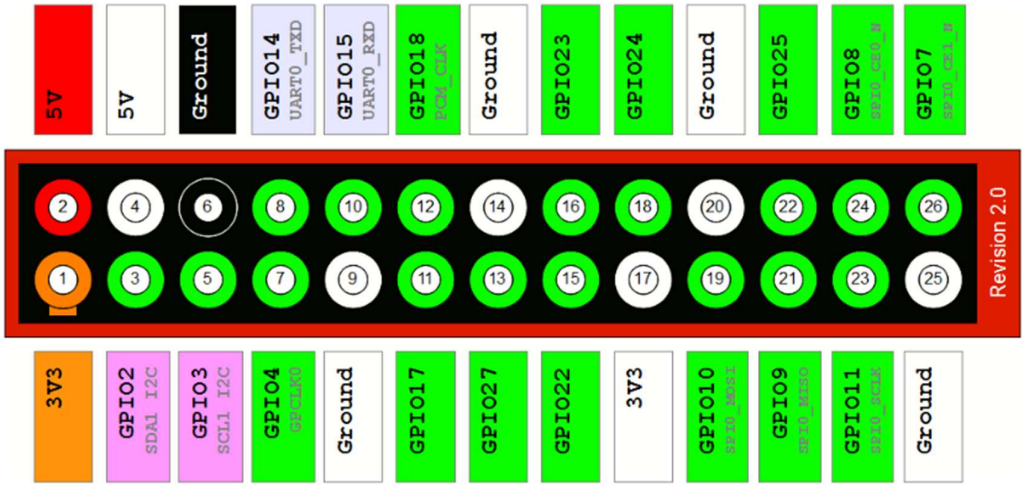
The **GPIO.BCM** option means that you are referring to the pins by the "Broadcom SOC channel" number, these are the numbers after "GPIO" in the green rectangles around the outside of the below diagrams:

Unfortunately the **BCM** numbers changed between versions of the Pi1 Model B, and you'll need to work out which one you have guide here. So it may be safer to use the BOARD numbers if you are going to use more than one Raspberry Pi in a project.

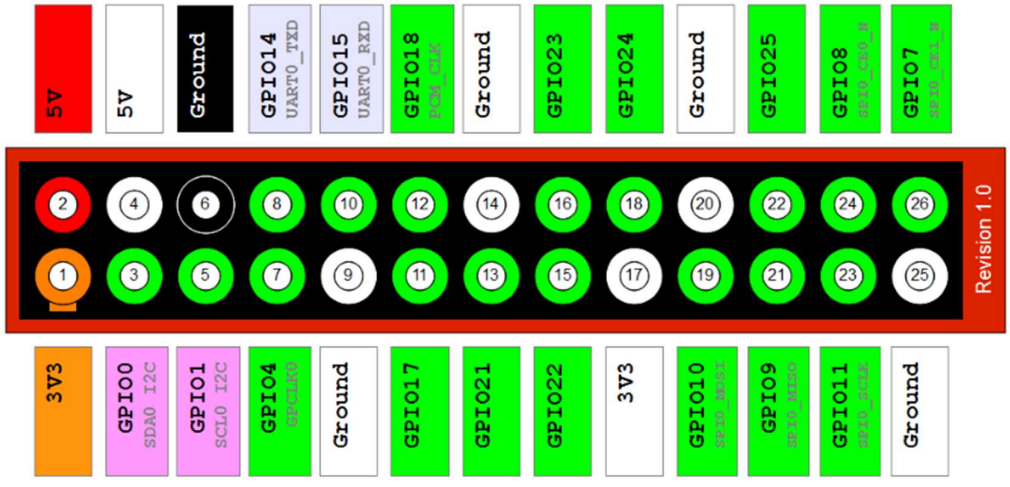
- The Model B+ uses the same numbering as the Model B r2.0, and adds new pins (board numbers 27-40).
- The Raspberry Pi Zero, Pi 2B, Pi 3B, and Pi 4B use the same numbering as the B+.

Pi1 Model B+, Pi 2B, Pi Zero, Pi 3B, and Pi 4B:

Pi 1 Model B Revision 2.0:



Pi 1 Model B Revision 1.0:



Programming GPIOs with Python RPi.GPIO Library

Download from here

https://pypi.org/project/RPi.GPIO/

Installation:

pip install RPi.GPIO

The first step in any project using the `RPi.GPIO` module is to import it into our Python script.

```
import RPi.GPIO as GPIO
```

We can also set the mode to reference the pins either by their board number or by their Broadcom (BCM) chip-specific pin number.

```
GPIO.setmode(GPIO.BCM)  # Use BCM numbering
# or
GPIO.setmode(GPIO.BOARD)  # Use physical board numbering
```