Raspberry Pi GPIO Cheat Sheet

**I2C**
A low-speed interface used to communicate with multiple simple devices and sensors via a two-wire interface.

Inter-Integrated Circuit (I2C) is a serial bus interface which supports multiple devices and only requires two wires for communication (no separate clock or device select needed). It is, however, limited to relatively low speeds (usually 10–100kHz).

**CLK**
Clock signals are used to provide a pulse that can synchronise different parts of a system that perform actions which are time sensitive to each other.

GPCLKO is a general purpose clock that generates a square-wave clock signal up to a maximum frequency of around 75MHz.

**UART**
The UART pins on the Raspberry Pi are primarily provided for access to the serial console which is a relatively advanced feature that most people won’t need to use.

Universal Asynchronous Receiver/Transmitter (UART) is a method of transmitting data over a serial connection. Both of the communicating devices contain a shift register that converts the bytes of data being transmitted into a stream of bits.

**PWM**
Provides an analogue-style supply that can be used for controlling motors and LEDs.

With PWM (pulse-width modulation) the amount of power delivered to the device is controlled by switching the supply on and off very quickly, typically thousands of times a second.

**SPI**
Often used to read more complicated sensors, drive simple displays, or communicate between devices.

Serial Peripheral Interface Bus (SPI) is a synchronous full-duplex (two-way) serial connection. Communication happens between a master device and slave device with the master device providing synchronisation.

The data is transmitted on the MOSI (master-out, slave-in) and MISO pins (master-in, slave-out) pins. Each transmission is synchronised by a clock pulse on SCLK.