Introduction to Raspberry Pi
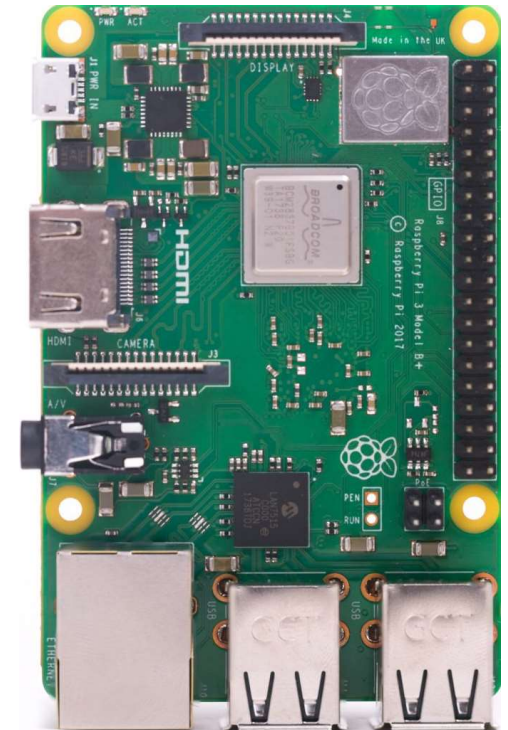
ROCHESTER MAKERSPACE

2019

Raspberry Pi 3 B+

- Broadcom BCM2837B0, Cortex-A53 (ARMv8) 64-bit SoC @ 1.4GHz
- 1GB LPDDR2 SDRAM
- 2.4GHz and 5GHz IEEE 802.11.b/g/n/ac wireless LAN, Bluetooth 4.2, BLE
- Gigabit Ethernet over USB 2.0 (maximum throughput 300 Mbps)
- Extended 40-pin GPIO header
- Full-size HDMI
- 4 USB 2.0 ports
- CSI camera port for connecting a Raspberry Pi camera
- DSI display port for connecting a Raspberry Pi touchscreen display
- 4-pole stereo output and composite video port
- Micro SD port for loading your operating system and storing data
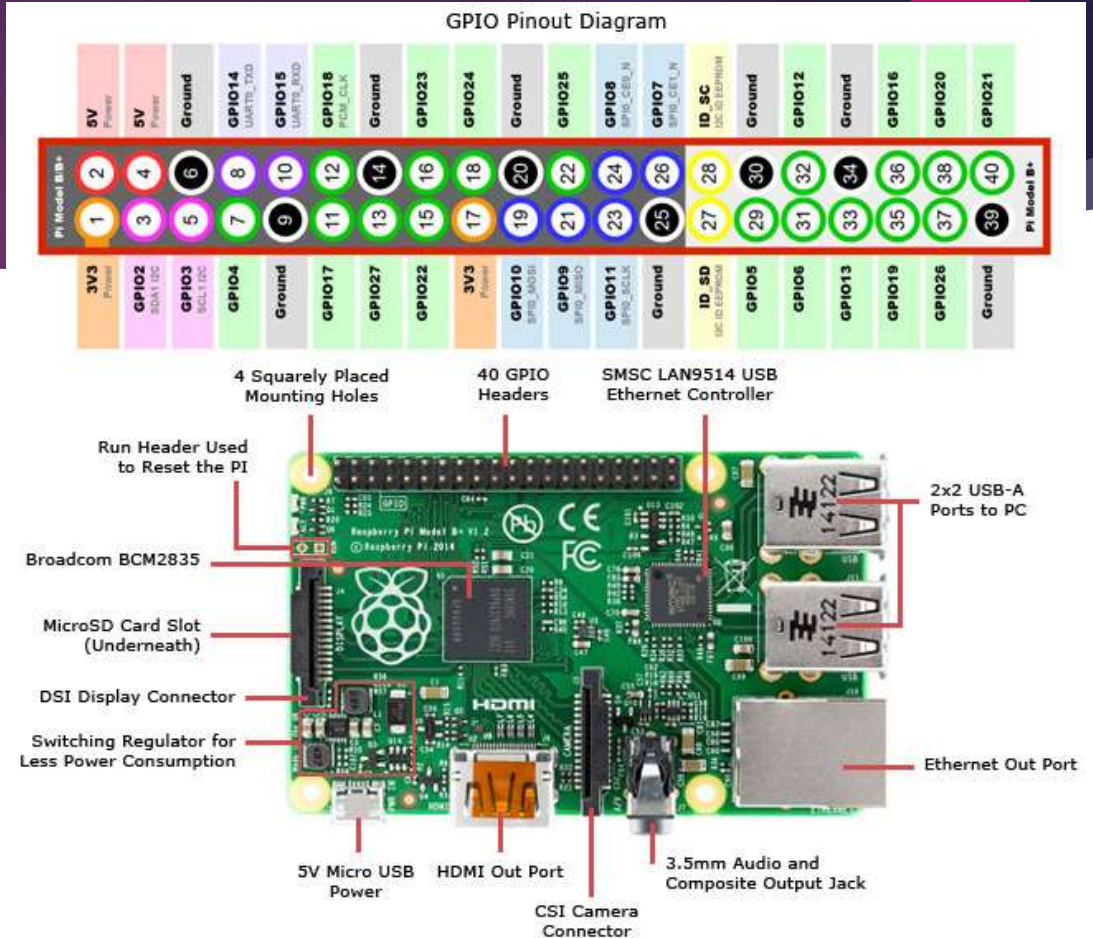- 5V/2.5A DC power input

History

▶ The Raspberry Pi was created in February 2012 by the Raspberry Pi Foundation to promote and teach basic computer science in schools and colleges around the UK.

▶ The Raspberry Pi Foundation is a UK-based charity that works to put the power of computing and digital making into the hands of people all over the world. We do this so that more people are able to harness the power of computing and digital technologies for work, to solve problems that matter to them, and to express themselves creatively.

▶ More than 1M units sold in the first year, more than 4.5M by 2014

Linux with GPIO!

GPIO Pinout Diagram

- At 1.4MHz, quad-core and 1MB of RAM, RPi is a capable small Linux system
- GPIO adds possibility of creating different projects e.g., robots

Comparison vs. Arduino

▶ Pros

　▶ More RAM + Storage

　▶ More processing power

　▶ Debug in place

　▶ Multiple, concurrent programs

　▶ Built-in HDMI and camera interfaces

　▶ Built-in WiFi and Bluetooth comms

　▶ Built-in Ethernet and 4 USB ports

　▶ Pluggable SD card to expand memory

▶ Cons

　▶ Non-real-time OS makes real-time programming impractical

　▶ Requires some understanding of Linux

　▶ Much more configuration required

　▶ More electrical power required

　▶ No A/D inputs

　▶ Narrow input voltage tolerance

Bottom Line: Choose the right tool for the job

Next Steps

▶ Check out these sources of information

  ▶ Raspberry Pi Manual

  ▶ Raspberrypi.org

  ▶ www.elinux.org

  ▶ Adafruit.com/category/105 – Raspberry Pi products and accessories

  ▶ Youtube.com

▶ Design a project or program and get started!

  ▶ Lots of examples online if you are looking for inspiration