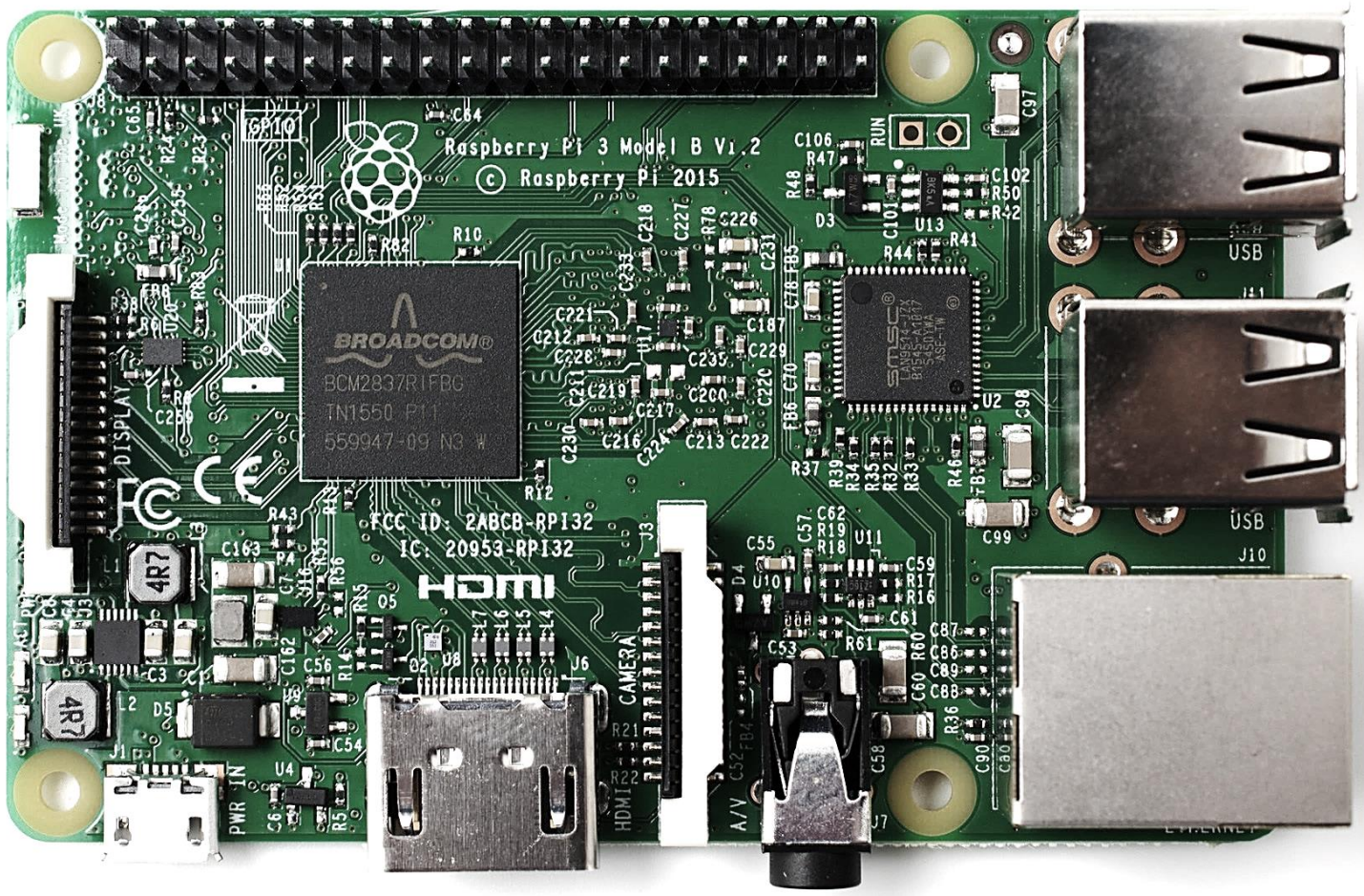
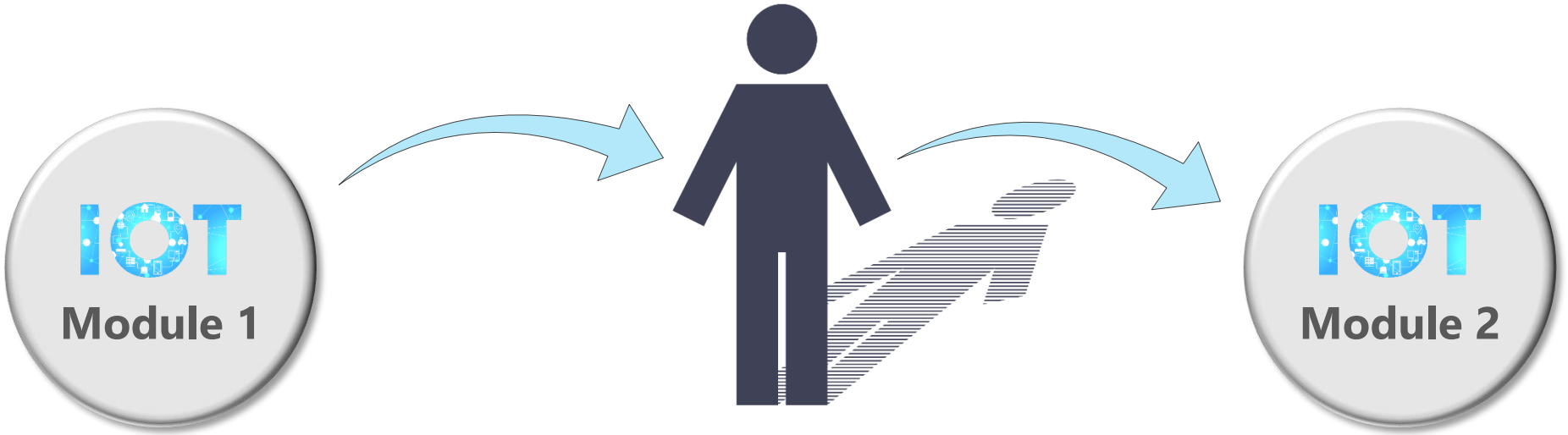


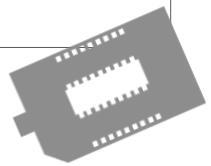
Powering IOT | Raspberry Pi

Introducing the Raspberry Pi

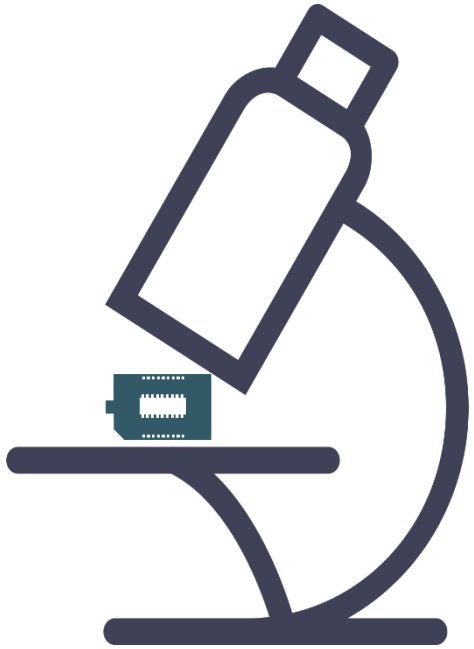
IOT – Module 2



Microcontroller programming
Arduino

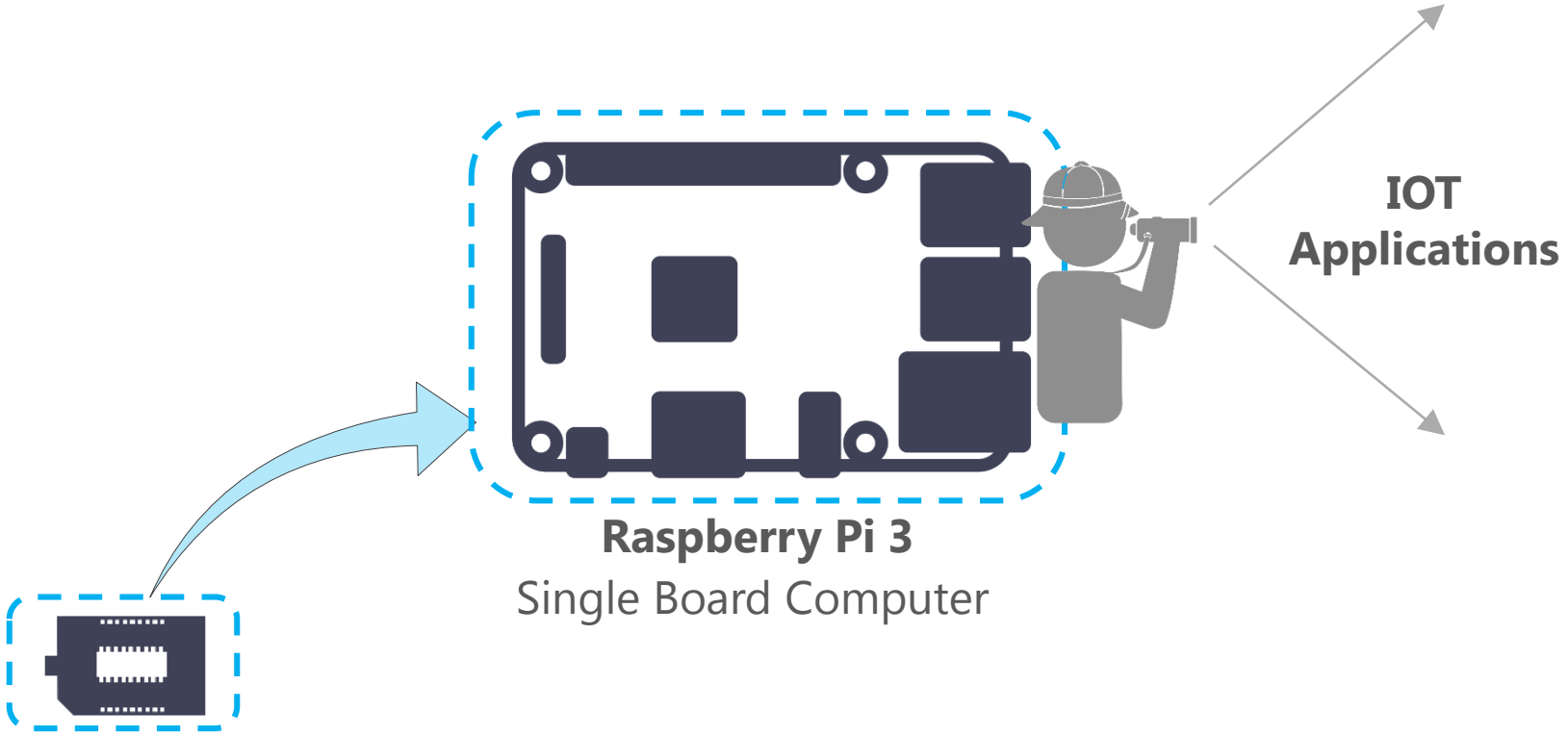


What we know from Module 1

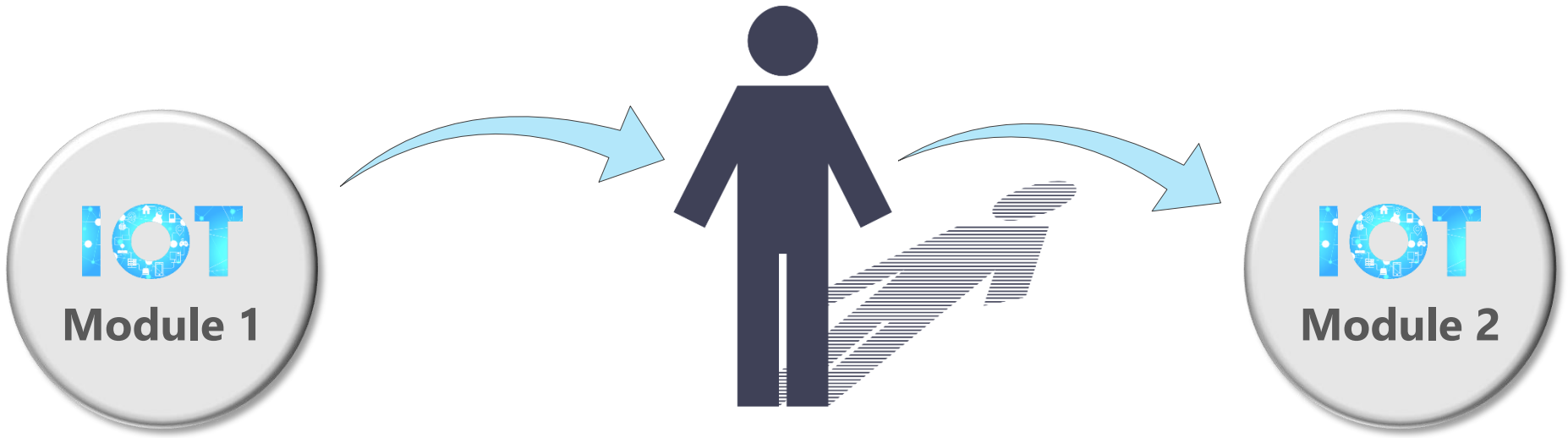


- How **sensors** are interfaced
- Why and how **external circuitry** is built
- **NodeMCU WiFi chipset** to introduce low-level networking concepts
- **Complete example** of an IOT application

In Module 2, we will learn

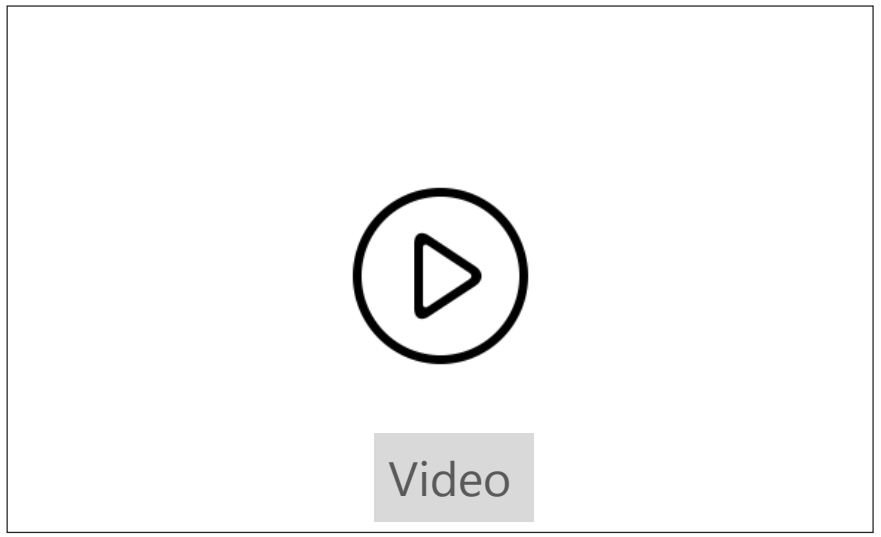


Do you need to cover Module 1 before Module 2?



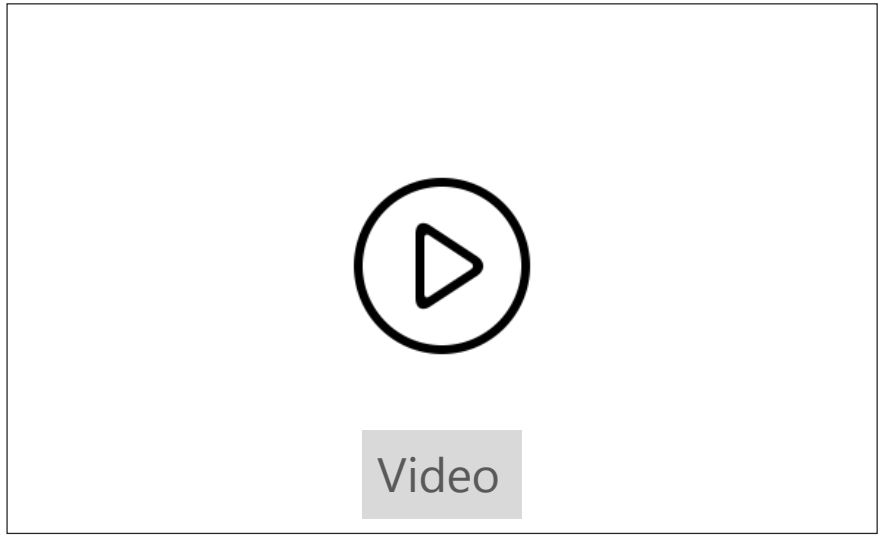
- IOT Module 2 is fairly self-contained
- While Module 2 builds on Module 1, it does not necessarily rest on it

Unboxing the Raspberry Pi



Video

The physical component



Video

The Raspbian desktop

Raspberry Pi Vs. PC

Raspberry Pi 3	Acer Aspire E 15	
ARMv8 CPU (Cortex-A53), 64-bit	Intel Core i5	CPU
1.2 GHz	2.3 GHz	CPU Speed
1 GB	8 GB	RAM
VideoCore IV 3D	NVIDIA GeForce 940MX	Graphics
802.11n WLAN, 100 MHz Ethernet, BT 4.1, 4 x USB	802.11ac WLAN, Gigabit Ethernet, BT 4.1, 4x USB	Connectivity

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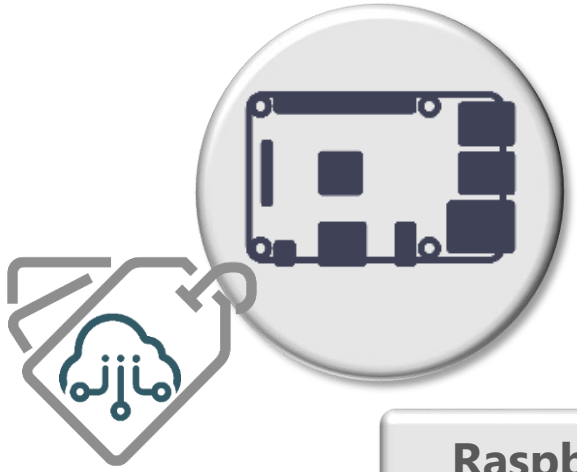


Raspberry Pi is indeed usable as a regular PC replacement

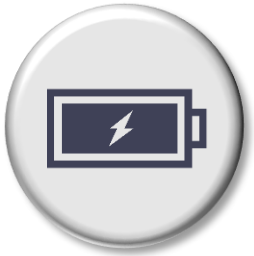
Raspberry Pi 3	Acer Aspire E 15	
~5 Watts	~65 Watts	Power Consumption
$35	~$500	Price
85 x 56 x 17 mm	380 x 250 x 25 mm	Dimensions
40 GPIO pins	??	Extensibility

Raspberry Pi Vs. PC

15-inch monitor draws around 15 Watts

Laptop consumes around 20 Watts

¼ power consumption



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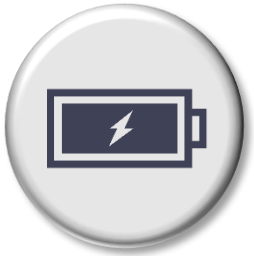
1/10 the cost of a PC

Raspberry Pi Vs. PC

PC is 3-5 times more expensive than Raspberry Pi

Raspberry Pi 0 = $5



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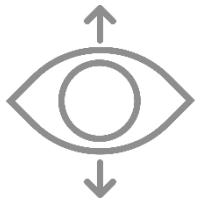
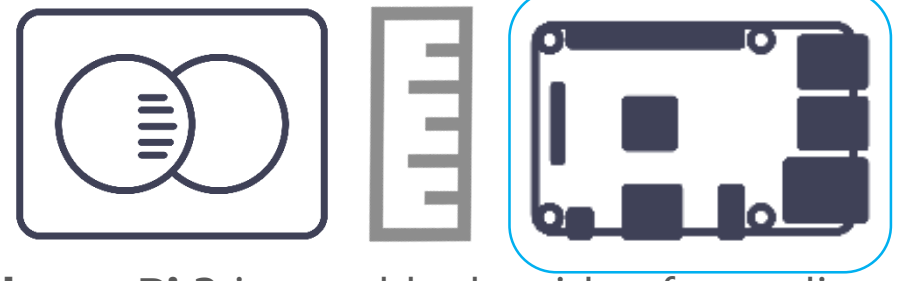
Raspberry Pi Vs. PC



As an IOT Device

Raspberry Pi is a clear winner

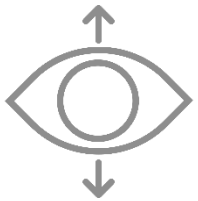


Raspberry Pi 3 is roughly the side of a credit card

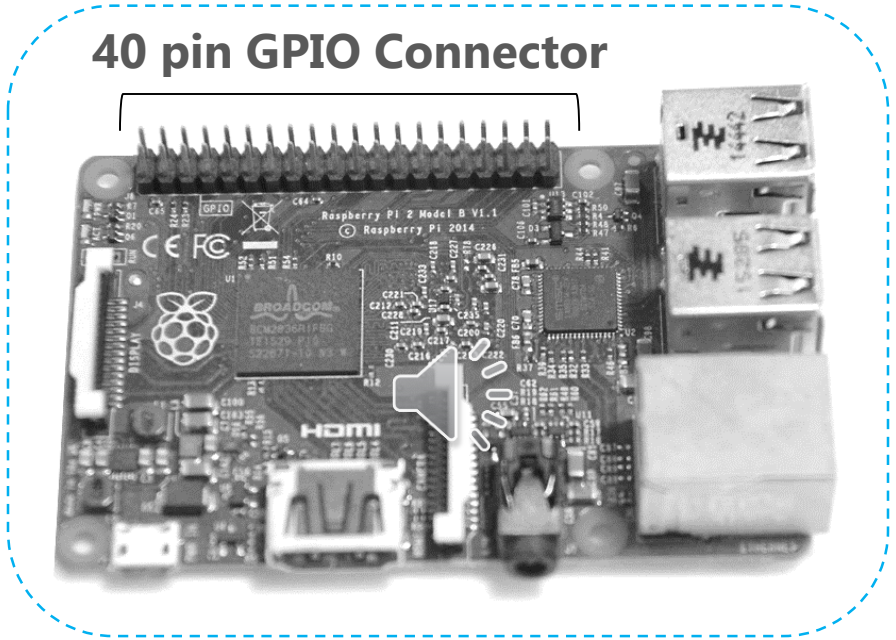
Raspberry Pi 0 is around the size of a thumb drive

Does not need a fan or other mounting device

Raspberry Pi Vs. PC



As an IOT Device

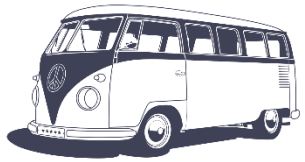


Allow the interface various **sensors and actuators** to Raspberry Pi and extends its functionality

Evolution of SBC

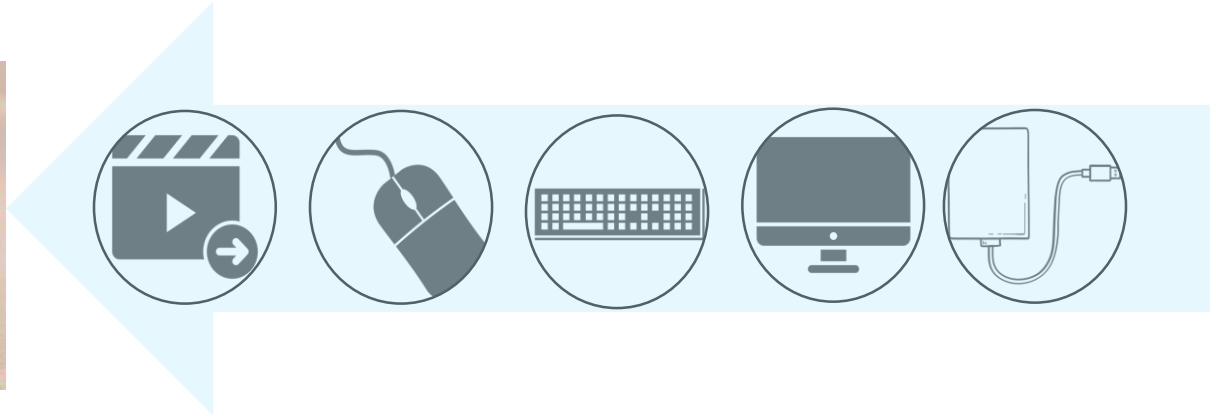
Single Board Computer or SBC

- ❑ Any computer that fits on a **single printed circuit board**
- ❑ SBCs first appeared in 70s
- ❑ **Modern SBCs** started appearing in the market around 2008



SheevaPlug

Beagle Board from Texas Instruments based on OMAP 3530



First SBC in the same league as Raspberry Pi

Image Credits: Beagle Board – Jason Kudrik, SheevaPlug – Chievery,

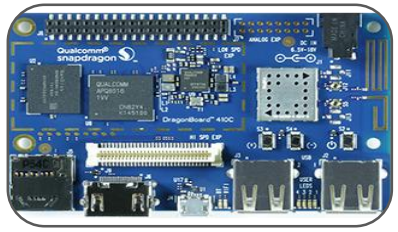
Evolution of SBC

2012

Raspberry Pi 3

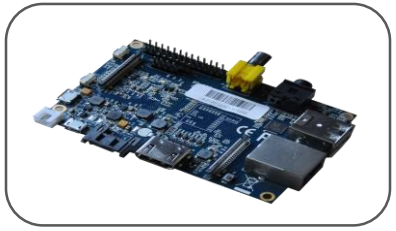
Raspberry Pi 0

Intel **Galileo**

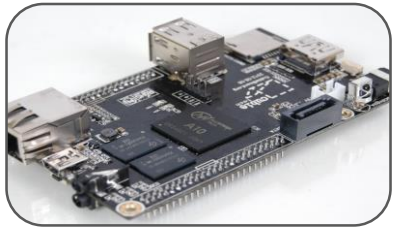


Qualcomm **Dragon board**

Broadcom chipset



Banana Pi



Cubieboard

Allwinner's A20 chipset

SBCs based on Realtek Hardware

Single Board Computers

- Fast growing category
- Raspberry Pi
- Vast range of options

Image Credits: Raspberrypi.org, Wikipedia, qualcomm.com, Banana Pi.com, linux.sunxi.org

Recap

Video

Introduction to Raspberry Pi