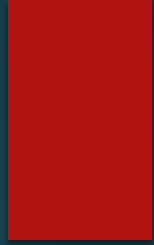




Az Európai Unió
támogatásával



Discover the Green Life with Robots

2023-1-HU01-KA210-VET-000156243

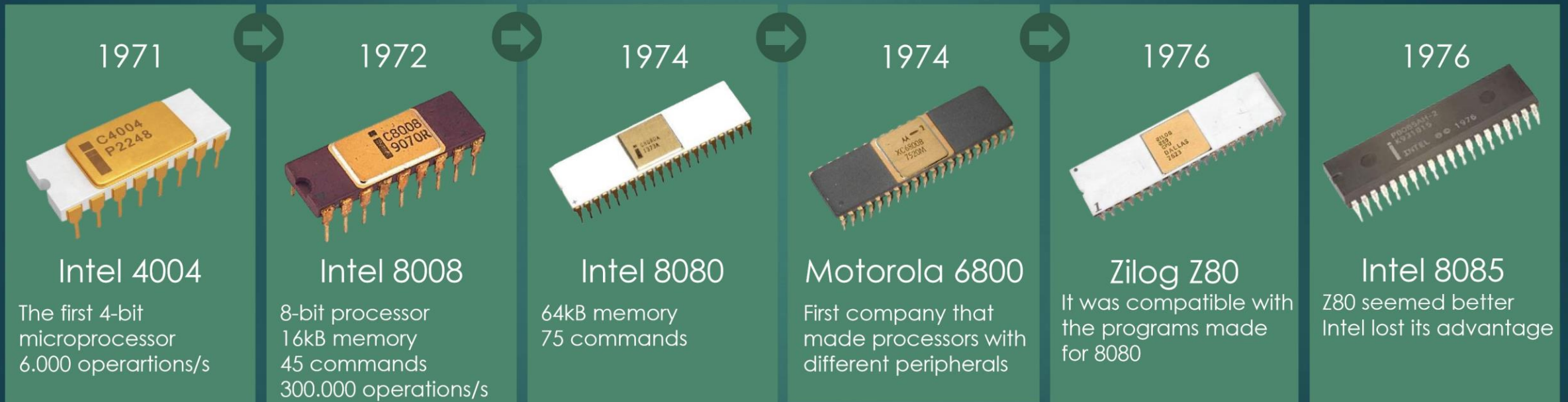
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MADE BY
MARK GARAI

Microcontrollers

History of microprocessors

- ▶ 1969 – Busicom commissioned Intel to manufacture a PCB
 - ▶ Marcion Hoff (Project manager) suggested to make circuit board, works as its program says



- ▶ In 1976, microcontrollers and microprocessors split

What is a microcontroller?

- ▶ (Usually) includes a microprocessor, memory and input/output peripherals on a single chip
- ▶ Designed to control small features of a larger component, without an operating system
- ▶ It receives data from its I/O peripherals using its central processor
- ▶ The information is stored in its data memory, where the processor accesses it ⁷ Instructions

Microcontroller	Microprocessor
<ol style="list-style-type: none">1. CPU, RAM, ROM, I/O and timer are all on a single chip2. Fix amount of on-chip ROM, RAM, I/O ports3. Single purpose4. Highly bit addressable	<p>CPU is stand alone, RAM, ROM, I/O and timer are separate</p> <p>Designer can decide on the amount of RAM, ROM and I/O ports</p> <p>General purpose</p> <p>Expensive</p>





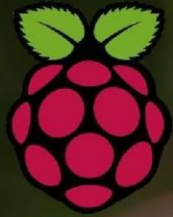
Modern microcontrollers

Where do we use microcontrollers?

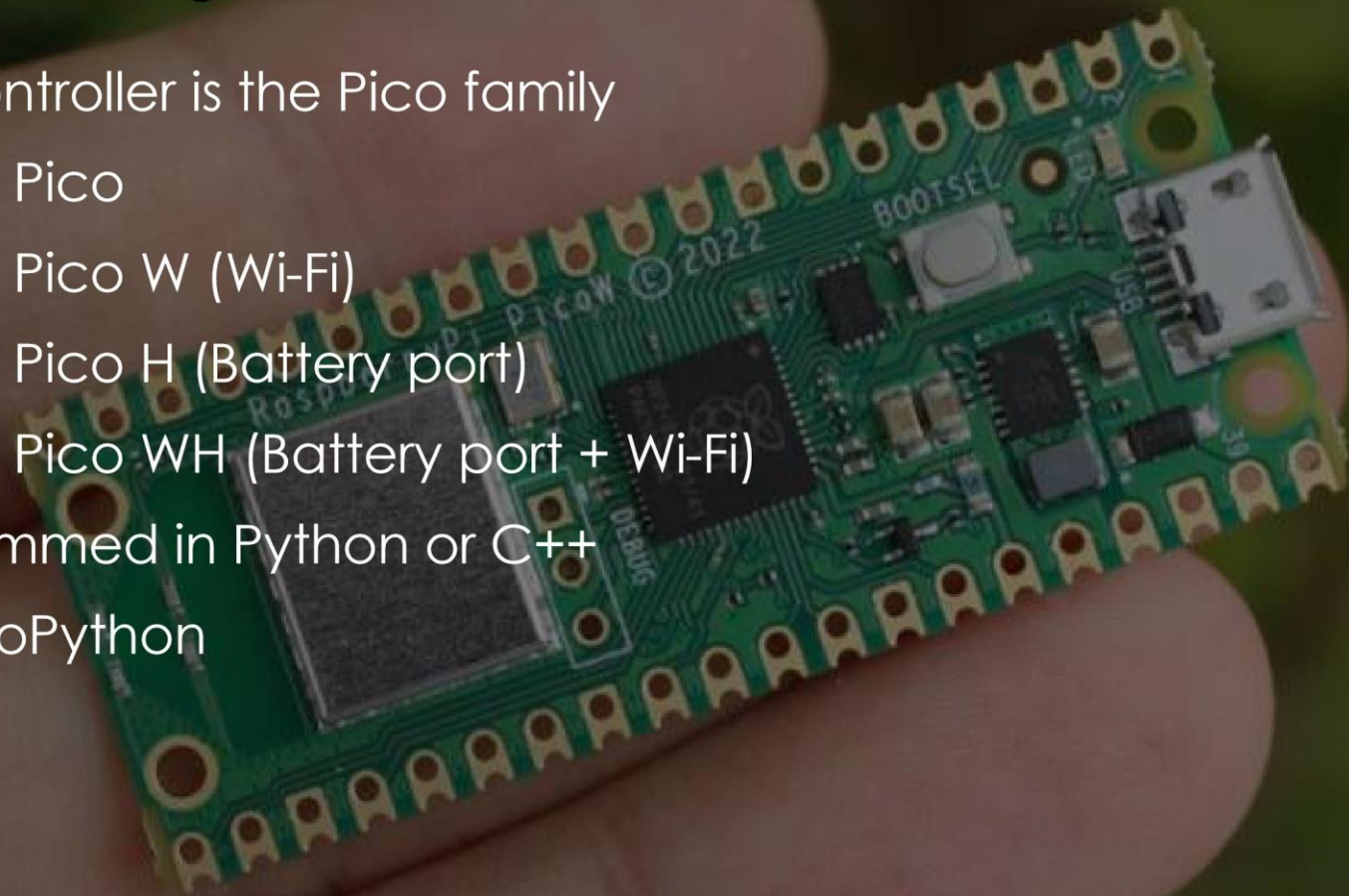
- ▶ Smart Home Devices: Security systems, and home automation devices → IoT Projects, automatization
- ▶ Automotive Systems: Navigation systems, and vehicle diagnostics
- ▶ Medical Equipment: Monitoring systems, implantable devices, medical instruments



Raspberry



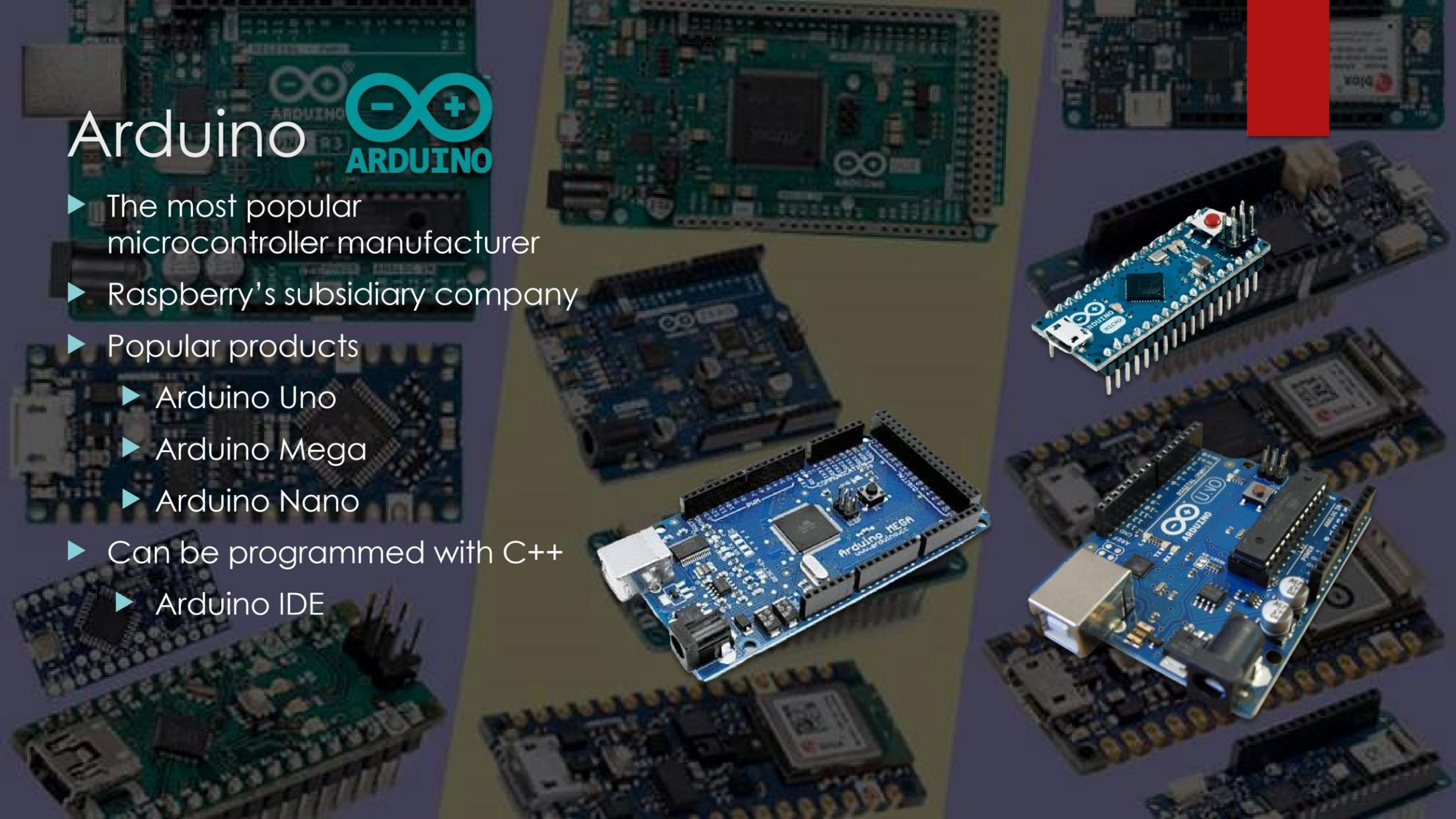
- ▶ Its only microcontroller is the Pico family
 - ▶ Raspberry Pi Pico
 - ▶ Raspberry Pi Pico W (Wi-Fi)
 - ▶ Raspberry Pi Pico H (Battery port)
 - ▶ Raspberry Pi Pico WH (Battery port + Wi-Fi)
- ▶ Can be programmed in Python or C++
 - ▶ Thonny MicroPython
 - ▶ Arduino IDE



Arduino

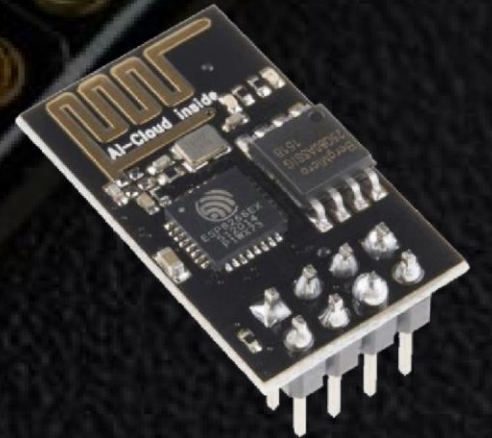


- ▶ The most popular microcontroller manufacturer
- ▶ Raspberry's subsidiary company
- ▶ Popular products
 - ▶ Arduino Uno
 - ▶ Arduino Mega
 - ▶ Arduino Nano
- ▶ Can be programmed with C++
 - ▶ Arduino IDE



Espressif

- ▶ A cheaper and better alternative
- ▶ 2 Main board-families
 - ▶ ESP32 Series
 - ▶ ESP8266 Series
- ▶ Can be programmed in Python or C++
 - ▶ Thonny MicroPython
 - ▶ Arduino IDE



Thank you for your attention!