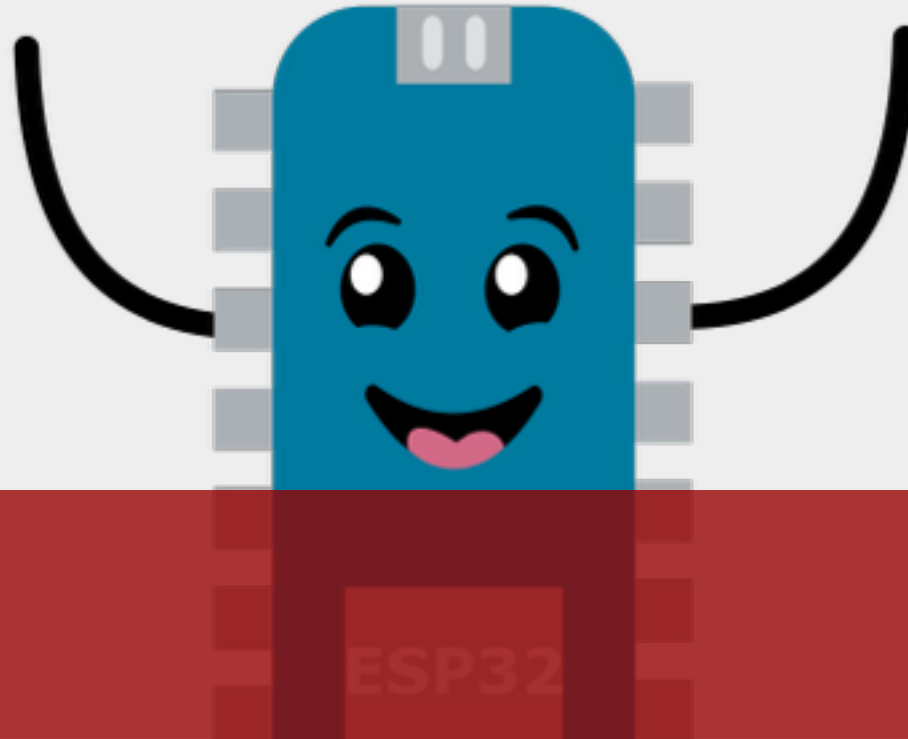
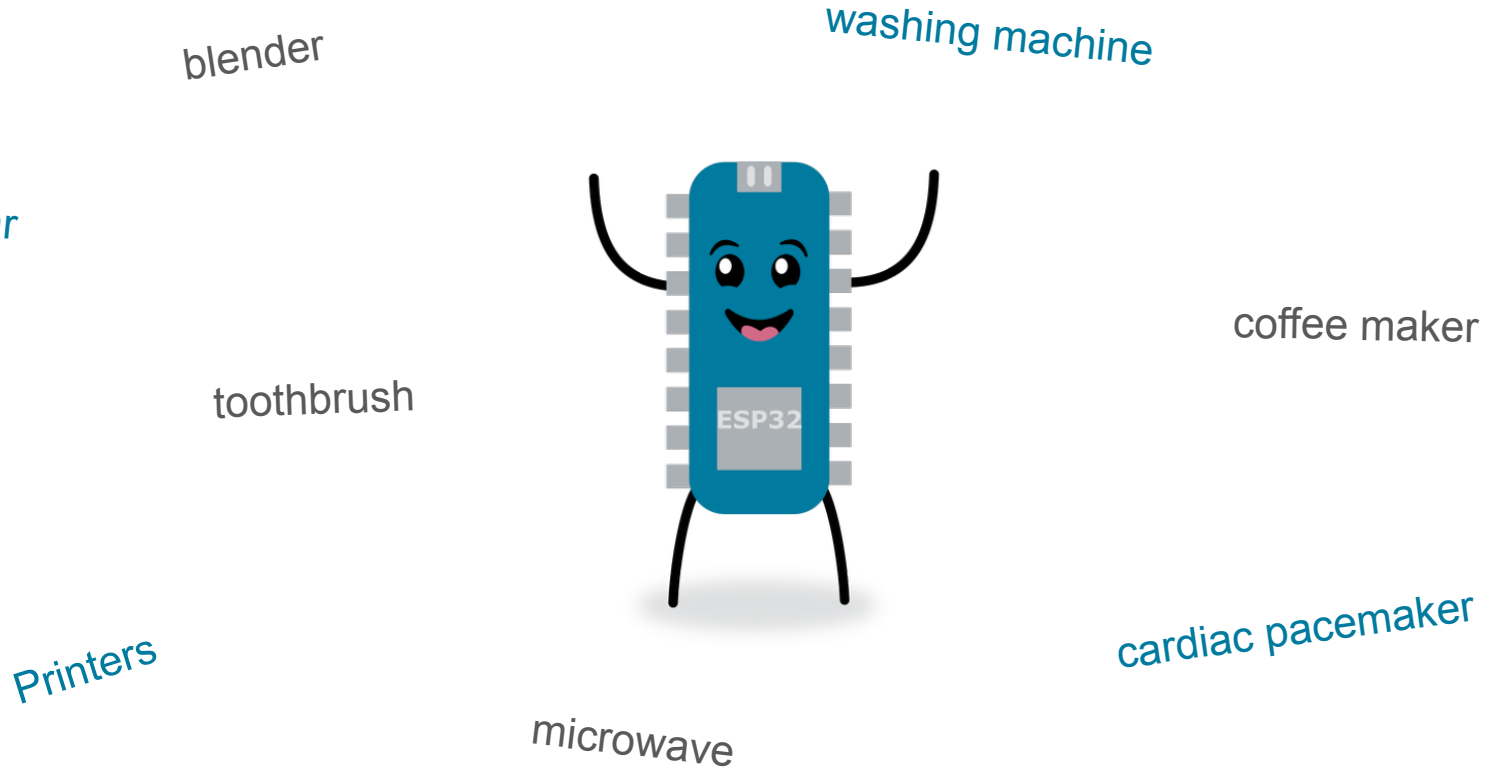




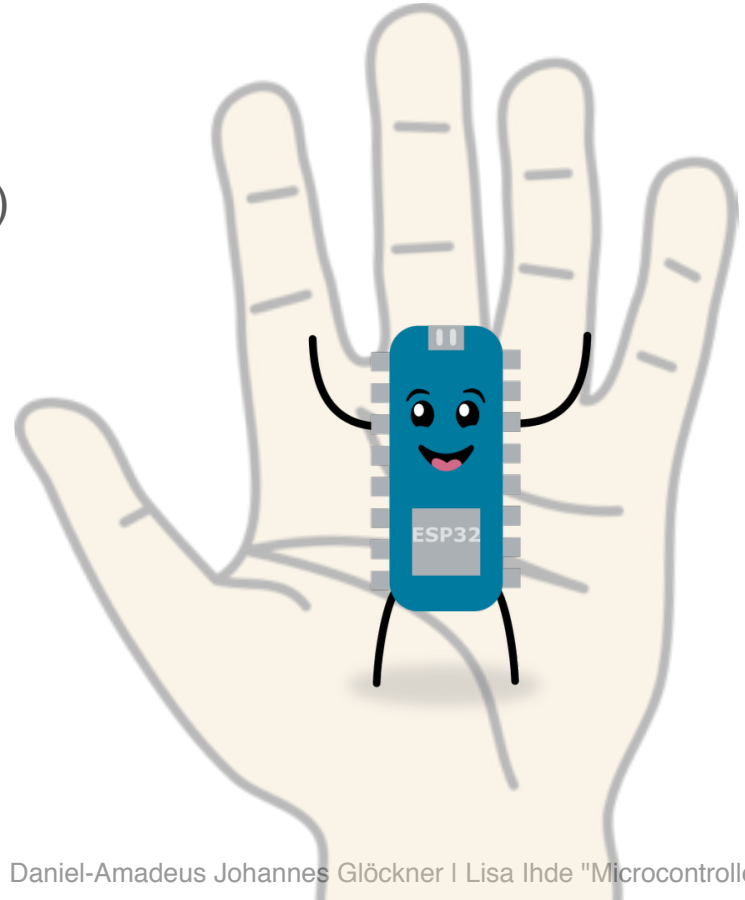
Mikrocontroller

Woche 1 | Lektion 1

ESP32



- Chip with a specific task
 - Integrated processor (CPU)
 - Working memory (RAM)
 - Programmable inputs and outputs (pins)
- Executes only **one** program at a time
- Small practical size
- Low cost
- Easy to program



Arduino Uno



Calliope Mini



**ESP32
development
board**





- **ATmega328 microcontroller**
- **open source**
 - Anyone can create their own version of Arduino for free.
 - The original Arduino costs **about 20€**.
- **Arduino IDE**
 - Includes a collection of sample programs that show the basic commands/functions of the Arduinos
 - Programming language: C/C++
- **Equipment:**
 - onboard LED



- 32-bit ARM processor
- The Calliope costs **approx. 35€**.
- <https://makecode.calliope.cc/>
 - **Block-based** programming or **JavaScript**
 - simulator
- **Equipment:**
 - Red 5x5 LED matrix and one RGB LED
 - DC motor driver
 - Bluetooth
 - Sensors (acceleration, rotation, magnet)
 - Two buttons
 - microphone
 - **buzzer**



- ESP32 Microcontroller with Tensilica Xtensa LX6 Processor
- IoT chip (Internet of Things)
 - The ESP32 costs **about 8€**.
- **Arduino IDE** like Arduino Uno
- **Equipment:**
 - 2 cores / higher processor speed
 - Bluetooth
 - WLAN
 - touch sensor
 - magnetic sensor
 - on-board LED