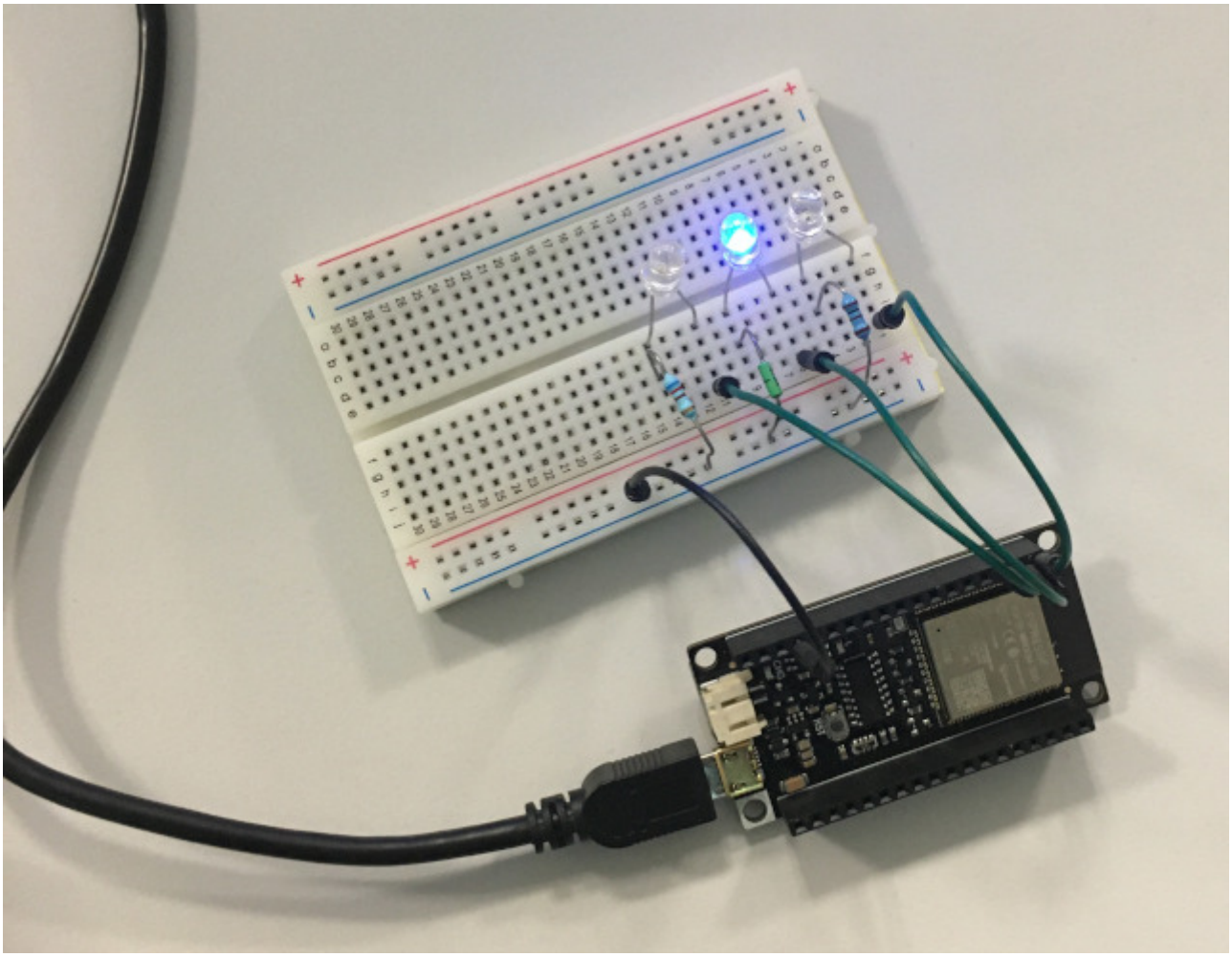
MicroPython on ESP32/ESP8266 microcontollers

The repository contains MicroPython lab exercises for *Digital Electronics* course at Brno University of Technology, Czechia.



Exercises

1. Tools for programming and debugging ESP32 microcontrollers
2. Programming in Python, Git version-control system
3. Control of GPIO pins
4. Timers

List of examples

- Blink
- Timer blink
- Wi-Fi scan
- Wi-Fi connection
- I2C humidity & temperature sensor
- I2C sensor & ThingSpeak
- RTC & NTP times
- Wi-Fi access point

- Web server & I2C sensor
- Jupyter example

Components

The following hardware and software components are mainly used in the lab.

- Devices:
    - ESP32
- Boards:
    - FireBeetle ESP32 board: Schematic & manual, pinout
- Sensors and modules:
    - DHT12 I2C humidity and temperature sensor: data sheet
    - MPU6050 gyroscope and accelerometer: data sheet
    - DS3231 I2C real time clock: data sheet
    - HC-SR04 ultrasonic sensor
    - Analog joystick PS2
- Analyzers:
    - 24MHz 8-channel logic analyzer: software
    - Oscilloscope Keysight Technologies DSOX3034T (350 MHz, 4 analog channels), including 16 logic timing channels DSOXT3MSO and serial protocol triggering and decode options D3000BDLA
- Development tools:
    - Thonny, Python IDE for beginners
    - Visual Studio Code
- Other tools:
    - git

References

1. How to use MicroPython and ESP32/ESP8266
2. IDEs for MicroPython
3. ESP32 brief overview (YouTube video)
4. Getting started with MicroPython on the ESP32
5. Video tutorial about ESP32 MicroPython
6. MicroPython Documentation. Quick reference for the ESP32
7. 40+ MicroPython Projects, Tutorial and Guides with ESP32 / ESP8266