Exercise no.: 1

Set up and say hello (CYW LED)

Objectives

1. Configure the CYW GPIO connected to the onboard LED
2. Initialize uart0 to run with the following parameters: baud 115200, 8 data bits, 1 stop bit, no parity, fifo disabled.
3. Write a program which will send, with a 1 Hz frequency:
    a. ‘H’ character using *uart_putc()* function,
    b. the missing “ello World” using *uart_puts()* function,
    c. “Counter value: X” where X stands for the amount of times the main loop has executed. Use *printf()* for that.
    d. Blink the LED every time it transmits a message.

    Remember to separate lines with carriage return and new line.
4. Receive the messages with the Serial Monitor tool built-into your Visual Studio Code profile (it comes with the official Raspberry Pi (RPI) Pico extension).

Description

The aim of this task is to make you accustomed to the tools we’ll be using (especially the serial port) and make sure your toolchain works correctly.

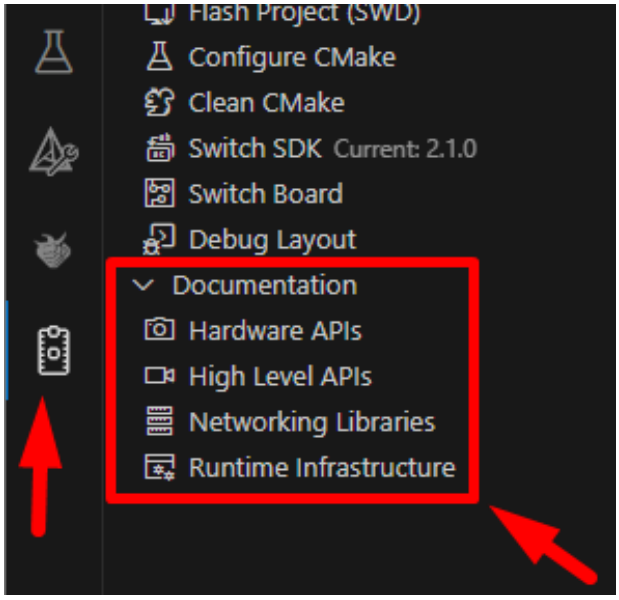
Hints

1. On Pico 2 W, the user LED isn’t connected directly to RP2350 but rather to one of the GPIO pins of the CYW43439 wireless interface. Pico SDK provides easy access to it by following the steps below:
    a. Add *pico_cyw43_arch_none* to the *target_link_libraries* section of the CMakeLists.txt file.
    b. Include: "pico/cyw43_arch.h"
    c. Call the initialization function ONCE: *cyw43_arch_init()* right after *stdio_init_all()*
    d. Control the pins state with: *cyw43_arch_gpio_put(CYW43_WL_GPIO_LED_PIN, <state: true or false>)*

    Unlike with normal GPIOs, there is no configuration required.

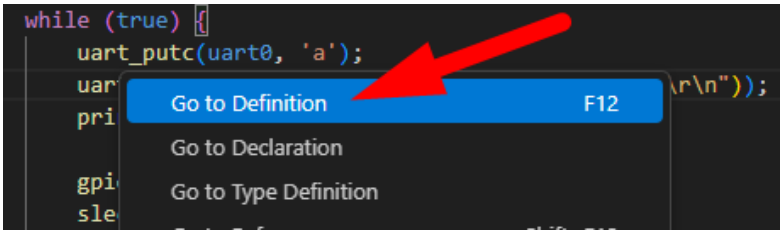
2. *sleep_ms* is a simple delay function that you can use to control the approximate frequency with which your loop executes.

3. Remember that there is some decent quality documentation available for your RP2350 MCU. The SDK documentation comes built-into the RPI Pico extension



and can be accessed here:
Make sure to refer to the documentation every time you want to learn more about a certain function or when you are unsure how to access the desired functionality.

If you want to quickly investigate basic information, like: what types of arguments a function takes or what other values are available in an enum then use the convenient “Go to…” options available after right clicking on the code.



4. Remember the IDE offers you extensive auto-complete functionality, which automatically appears when you start typing. You can invoke it or make it more verbose by pressing ctrl+space.

Links

RP2350 datasheet: https://datasheets.raspberrypi.com/rp2350/rp2350-datasheet.pdf
RP2350 home page: https://www.raspberrypi.com/products/rp2350/
RPI Pico 2 getting started: https://www.raspberrypi.com/documentation/microcontrollers/pico-series.html#pico-2-family
Pico 2 W datasheet: https://datasheets.raspberrypi.com/picow/pico-2-w-datasheet.pdf
Pico-Sensor-Kit description (schematic can be downloaded from this page): https://www.waveshare.com/wiki/Pico-Sensor-Kit-B