

## Exercise 1: Initial Setup

Learning Outcome: To get familiar with Raspberry Pi Pico W and MicroPython.

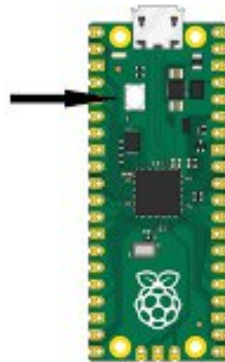
### Tasks to do

- Setup MicroPython on Raspberry Pi Pico W
- Blink the onboard LED available on Pico W with a timer delay
- Familiarize yourself with communication interfaces available on Pico W (e.g. Test BME 280 with I2C or SPI interface)

## Implementation

### 1. Setup MicroPython on Raspberry Pi Pico W

- **Download MicroPython Firmware**
  - Go to the official [MicroPython website](https://micropython.org/) and download the latest .uf2 file for the Raspberry Pi Pico W.
- **Install MicroPython**
  - Connect the Raspberry Pi Pico W to your computer while holding down the BOOTSEL button.



- Release the BOOTSEL button after connecting. The Pico should appear as a USB drive on your computer.
- Drag and drop the downloaded .uf2 file onto the Pico's USB drive. The Pico will reboot and disconnect/reconnect.

For programming the Raspberry Pi Pico W, we have the option of using MicroPython in conjunction with the Thonny IDE or utilizing C++ through the Arduino IDE. In our exercise sessions, we will work with MicroPython.

**NOTE:** Check [this](#) out to see the Pico W Pinouts (Available also on Moodle - Exercise 1)

- **Install Thonny IDE**

- Download and install [Thonny IDE](#) from its official website.
- Open Thonny and select Tools > Options > Interpreter.
- Choose MicroPython (Raspberry Pi Pico) as the interpreter and set the correct port (*we can use auto detect port option*).

## 2. Blink the onboard LED available on PICO W with a timer delay

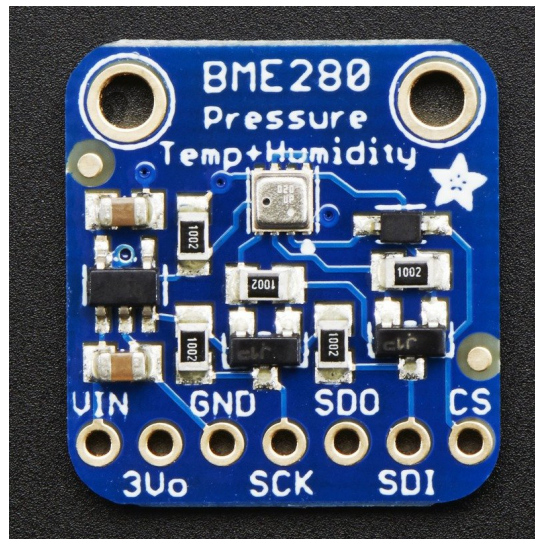
- Write the MicroPython Script
- Save the script to .py file in Thonny and upload it to Pico.

## 3. Familiarize with Communication Interfaces (Test BME280 with I2C)

- **Connect BME280**

Other BME2080	Adafruit BME2080	PICO W
VCC	VIN	3.3V (+)
-	3Vo	-
GND	GND	GND
SCL	SCK	Any I2C SCL
-	SDO	GND
SDA	SDI	Any I2C SDA
-	CS	-

- **Other BME:** Connect VCC to 3.3V, GND to GND, SDA to GPIO 20 (I2C0 SDA), and SCL to GPIO 21 (I2C0 SCL).
- **Adafruit BME:** If you are using the following version of BME280 sensor (see figure below) for I2C.
  - Pin SDA is at SDI (Serial Data = Data In)
  - Pin SCL is available at SCK (Serial Clock = Clock)
  - You also need to connect SDO (Serial Data Out) to GND.



**NOTE:**

1. To understand more about the Pinout of BME280 (Adafruit version), check this [link](#) out.
2. Please mind the channel of I2C (e.g. 0 or 1)

- **Install Required Libraries**

- Download/install via Thonny (*Tools > Manage Plugins > Search "micropython bme2080"*) or copy the BME280 MicroPython file from [Git](#).

- **Write the MicroPython Script**

- Write a script to initialize the BME280 sensor, read temp, pressure, humidity data, and print out the values.

- **Upload and Run the Script**

- Save the script in Thonny and upload it to Pico.
- Verify the sensor readings