

INTRODUCTION TO MICROCONTROLLERS

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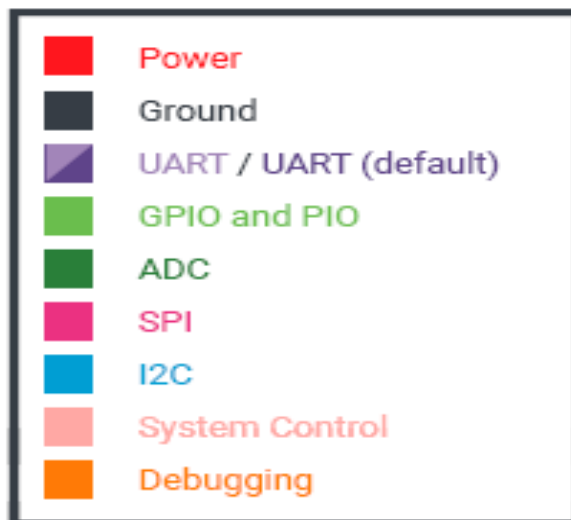
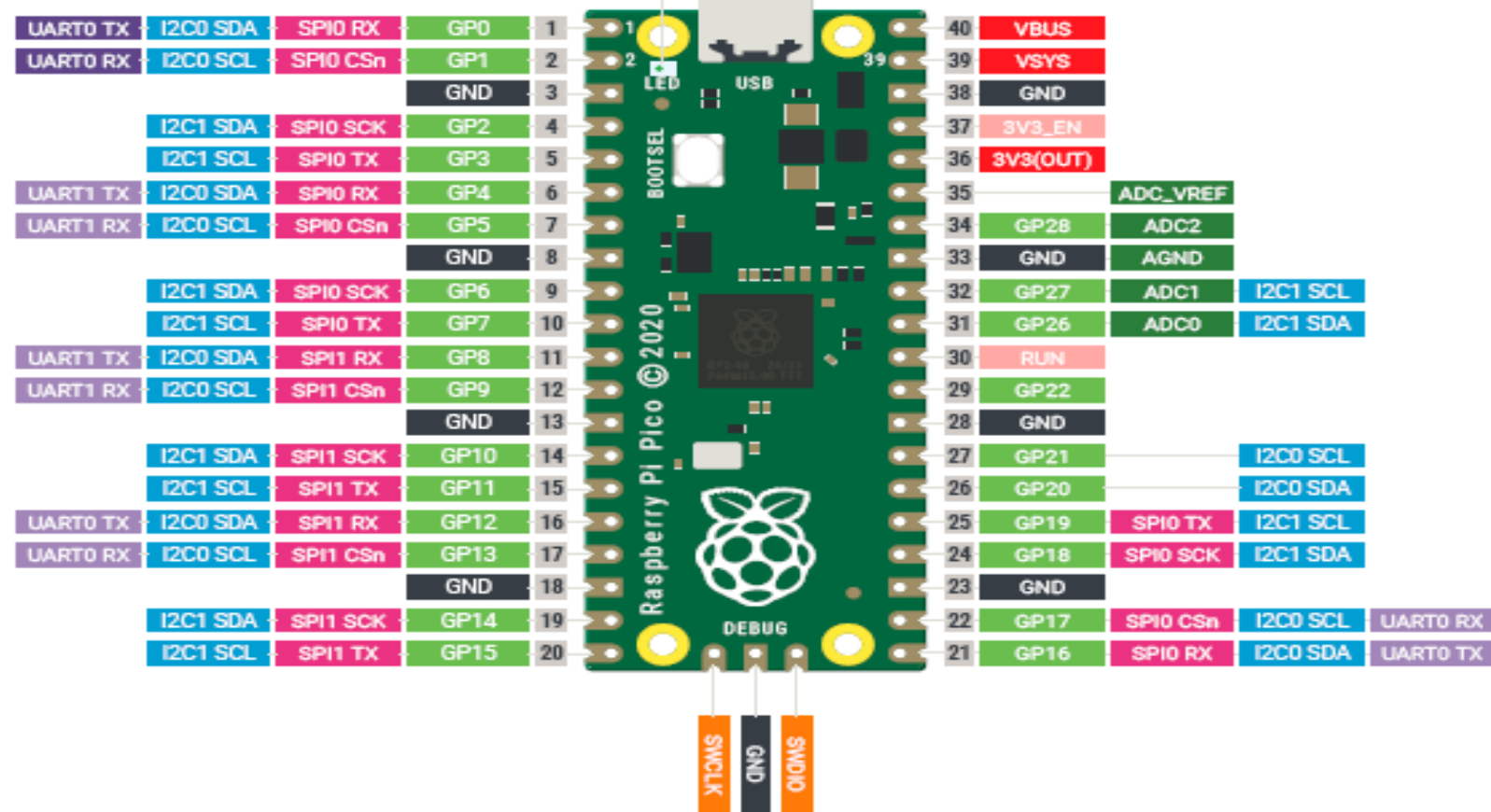
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INTRODUCTION

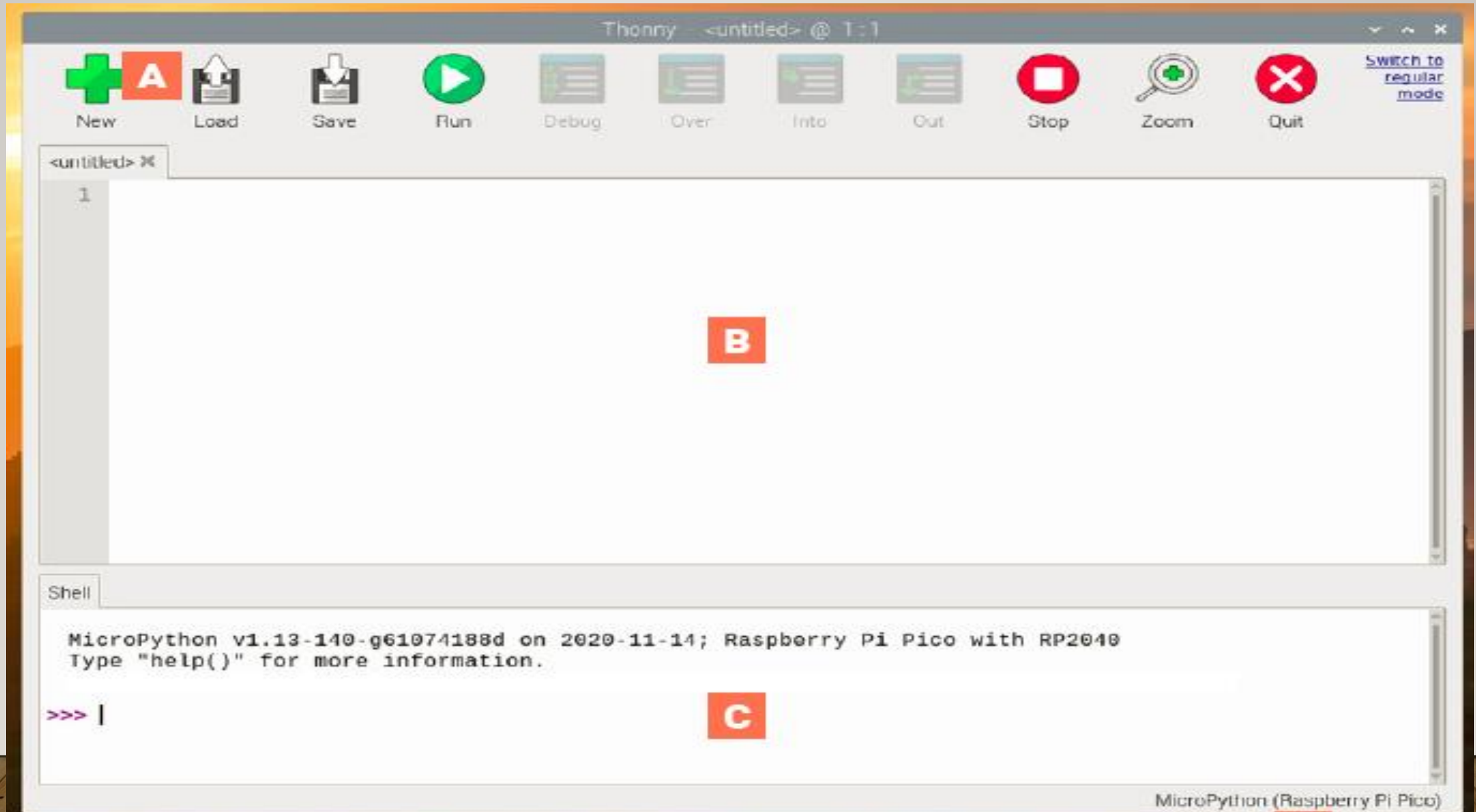
- ❑ Raspberry Pi Pico is a microcontroller board based on the RP2040 chip.
- ❑ Python is one of the programming languages supported by Raspberry Pi Pico.
- ❑ Several Python libraries are available to extend the functionality of Raspberry Pi Pico.



THONNY IDE

- ❑ Thonny is a beginner-friendly Python IDE that supports Raspberry Pi Pico.
- ❑ It provides a simple and intuitive interface for coding and debugging.
- ❑ It can be download for free from Thonny website <https://thonny.org>

THONNY IDE INTERFACE



MICROPYTHON

- ❑ MicroPython is a lightweight implementation of the Python programming language optimized for microcontrollers.
- ❑ It is the recommended programming language for Raspberry Pi Pico.
- ❑ MicroPython provides libraries and modules for various functionalities.

MICROPYTHON LIBRARIES

- **machine module:** Provides low-level access to the hardware on Raspberry Pi Pico, including GPIO pins, ADC, PWM, I2C, SPI, UART, and timers.
- **utime module:** Offers functions for working with time, including delays, timing measurements, and sleep.
- These libraries, along with the core MicroPython modules, provide a wide range of functionalities for working with Raspberry Pi Pico. Remember to import the relevant modules to access their features in your MicroPython code.

RP2040 PIO

- ❑ RP2040 PIO
- ❑ RP2040 PIO (Programmable Input/Output) is a unique feature of the RP2040 chip.
- ❑ It allows you to implement custom digital interfaces and protocols in Python.
- ❑ Libraries like RPPIO enable the use of RP2040 PIO in Python programs.

GPIO ZERO

- ❑ GPIO Zero is a Python library for controlling GPIO pins on Raspberry Pi Pico.
- ❑ It provides a simple and intuitive interface for working with digital inputs and outputs.

I2C AND SPI

- ❑ Raspberry Pi Pico supports I2C (Inter-Integrated Circuit) and SPI (Serial Peripheral Interface) communication protocols.
- ❑ Libraries like busio and spidev enable you to interface with I2C and SPI devices.

SUMMARY

- ❑ Python libraries play a crucial role in extending the functionality of Raspberry Pi Pico.
- ❑ Thonny IDE, MicroPython, and CircuitPython are widely used for programming Raspberry Pi Pico.
- ❑ Libraries like GPIO Zero, RP2040 PIO, I2C, SPI, and UART enable hardware interfacing and communication.



THANK YOU

