EMBEDDED SYSTEMS

Skill Tree: Color in the boxes and level up your skills

Use for individuals or as a group by picking a colour each and coloring in a part of the box. Everyone's journey is different and you can interpret the goals flexibly. The aim is to inspire you to learn and try new things. Not everything needs to be completed.

ADVANCED

(set your own goal)

(set your own goal)

(set your own goal)

(set your own goal)

(set your own goal)

Create a CI/CD System

Write a Real Time Operating System (RTOS)

Write a datasheet

Edit binary / hex to fix a problem after release

Write a bootloader

Use trace debugging to troubleshoot a problem

Create a software release process

Fix 49-day reboot problem with a calendar

Add Machine Learning (ML) to a device

Teach a class on embedded systems

Make a dashboard for monitoring remote units

Write a software for programming and testing many boards in manufacturing

Bit bang a communication driver

Write custom BLE GATT to communicate between devices

Use a multi core processor

Create your own custom PCB

Use a .map file to find a crash

Adapt RTOS to a new board

Optimize assembly code

Use multiple architectures in a software image

Blow fuses to test security in a project

Modify a Linker File

Debug a project with a logic analyzer

Reverse engineer communication protocols

Run unit tests in an algorithm sandbox

Identify burden voltage issue

Implement Direct Memory Access (DMA) in a project

Debug a fault in the hardware on a microcon-troller

Write manufacturing test software

Debug a project with an oscilloscope

Use a camera in a project

Bring a custom board through the bring-up process

Check a .lst or .map file to troubleshoot a problem

Use an IMU sensor to track motion in multiple axes

Update firmware for a project 'Over the Air' (OTA) using secure encryption

Set up a cross compiler

Use Mutual Exclusion (Mutex) in a project

Implement MCU Sleep in a low power project

Use USB, Wifi, Ethernet or CAN to communicate with a microcontroller

Use closed loop control (PID) to regulate a project

Create a circular buffer that uses more than 2 pointers

Update firmware for a project 'Over the Air' (OTA)

Display text on a screen in a different font

Use an Interrupt in a project

Use a step-through debugger to troubleshoot a problem

Use Pulse Width Modulation (PWM) to control RGB LEDs

Use a Real Time Operating System (RTOS)

Analyse a signal with Fast Fourier Transform (FFT)

Use Bluetooth Low Energy (BLE) for a project

Move a Motor

Buy someone else a dev board

Configure a timer

Use Pulse Width Modulation (PWM) to control something

Use a state machine

Understand how to use a circular buffer

Send data to the cloud

Debounce a button

Use continuity check to test conductivity on a Multimeter

Use I2C communication

Blink an LED

Commit to a version control system, eg. Github or others

Convert a signal from analog to digital (ADC)

Use UART Serial Communication

Use SPI to send data

Solder in your own header pins

Use circuit python for the first time

Get an Arduino

Use a Hardware Simulator eg. WokWi

BASICS

START HERE

Name: _____

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