ARDUINO

Tutorial 0
“The Kitchen Sink”

OCT 2021 by TeakSoon Ding
for STEMKRAF
https://github.com/teaksoon/stemkraf

3- STEMKRAF Arduino Uno Platform

4- Arduino IDE Cannot Upload / Arduino Uno Cannot Be Detected

5- Arduino PWM Pin and Timers

Note:
If you do not have a Computer and do not wish to spend alot of money, the cheapest way is to get an old working computer (most likely you can get it for FREE). Give it a second life with the Linux Operating System and you can use it comfortably to program your Arduino.

Linux Operating System uses very little resources and it is FREE.

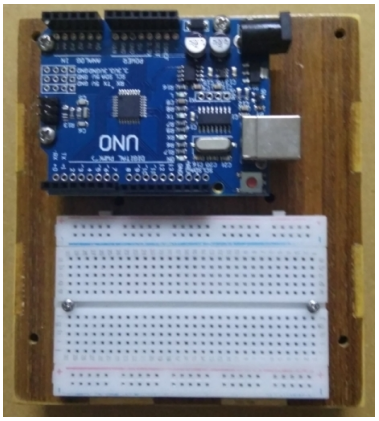
There is a small tutorial on how to do this,

https://github.com/teaksoon/stemkraf/blob/main/linux_arduino_installation.pdf

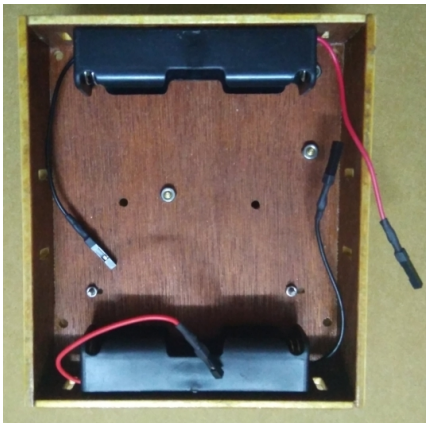
Arduino Uno is a small bare light weight board which does not have any enclosure or platform. It can easily move about or even drop off your table while you are working on it. It is good to have some kind of Platform to host the Arduino Uno Board. Enclosure is not good, because hard to access to all the pins and components on the board.

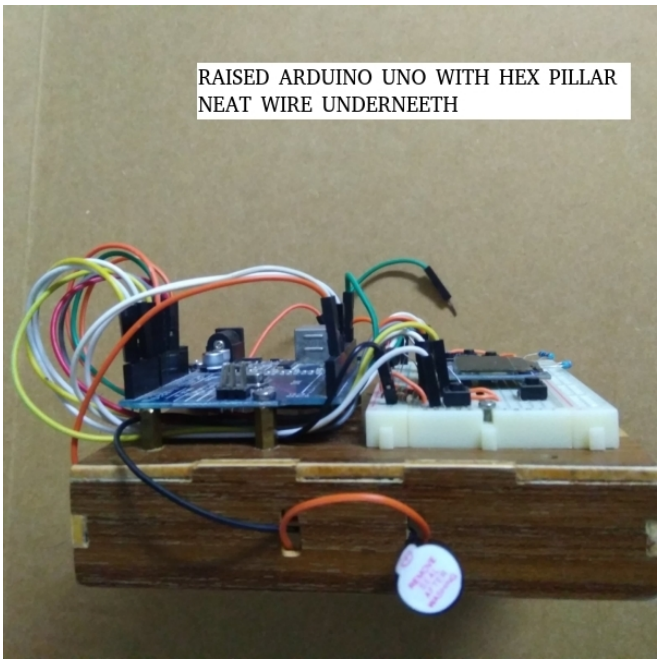
At STEMKRAF, we have this “handmade” Wooden Platform to host our Arduino Uno. Wood is chosen because it is non-conductive and it has very little static electric (high static electric from some plastics can potentially damage the board). Wood is also easily decomposable, so it does not harm the environment when disposed.

TOP SIDE

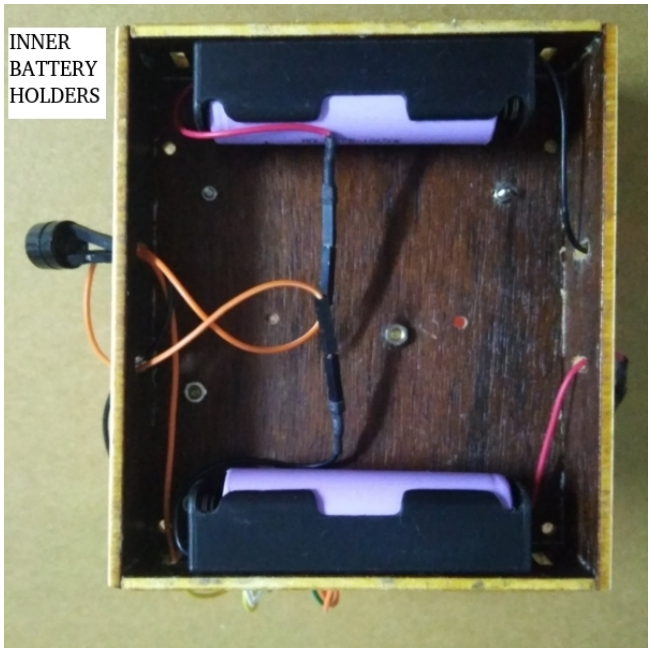


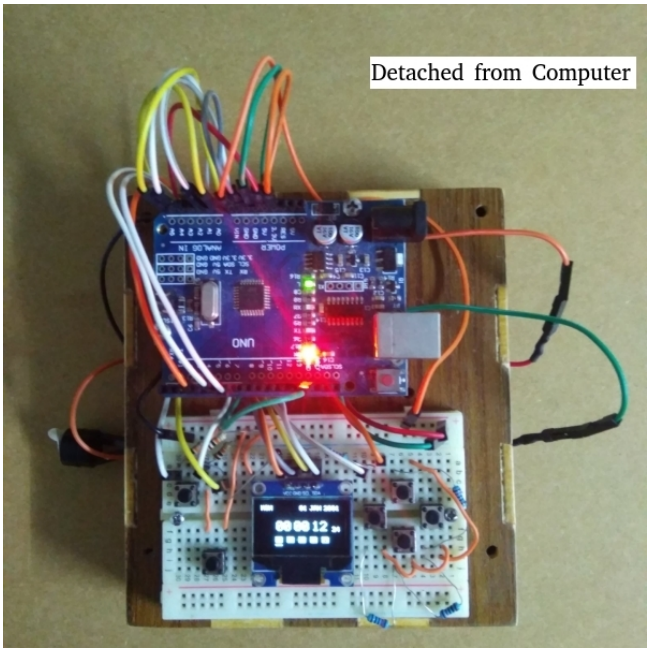
INNER





This Arduino Uno Platform have hex pillars to raise the Arduino Uno so that jumper wires can be neatly tucked underneeth. When installed with the 18650 batteries, this whole unit can be detached from the development computer USB connection. You can go around showing off your working product.





This Arduino Platform is “handmade”, only a few limited units available for Malaysian market only at : https://shopee.com.my/stemkraf

Most China Made Arduino Uno R3 Board uses the CH340 Chip for USB communication with the ATMEGA328P micro-controller chip.

Sometimes the **driver software** for the CH340 chip is not present on your development computer.

When this happens, your computer will not be able to recognize your Arduino Uno, you will not be able to upload your programs using the Arduino IDE Software or use the Serial Monitor function in your Arduino IDE Software.

You will need to download this driver from this website,

http://www.wch.cn/download/ch341ser_exe.html

and install it in your computer.

Some Arduino Library function uses the micro-controller internal Timers in their codes and that can cause trouble to some PWM Pins operation because PWM also uses micro-controller internal Timers.

Arduino Uno has 6 PWM Pins (3, 5, 6, 9, 10 and 11) that uses Timers for PWM. Arduino Uno (ATMEGA328P) has 3 Timers (Timer 0, Timer 1 and Timer 2)

Timer 0 (PWM for Arduino Uno Pin 5, Atmega328 PD5)
Timer 0 (PWM for Arduino Uno Pin 6, Atmega328 PD6)

Timer 1 (PWM for Arduino Uno Pin 9, Atmega328 PB1)
Timer 1 (PWM for Arduino Uno Pin 10, Atmega328 PB2)

Timer 2 (PWM for Arduino Uno Pin 3, Atmega328 PD3)
Timer 2 (PWM for Arduino Uno Pin 11, Atmega328 PB3)

The following popular class/functions from the Arduino Library that uses the micro-controller internal Timers.

1. delay(), millis() and micros() uses Timer 0. May interfere with devices connected to Arduino Pin 5 and Pin 6 that uses PWM.

2. Servo Class uses Timer 1. It disables PWM for Arduino Uno Pin 9 and Pin 10

3. tone() function uses Timer 2. May interfere with devices connected to Arduino Uno Pin 3 and Pin 11 that uses PWM.