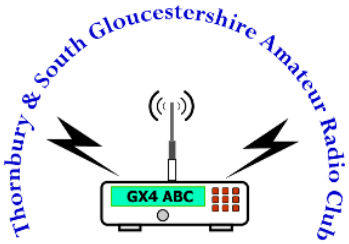
Arduino Beginners Course

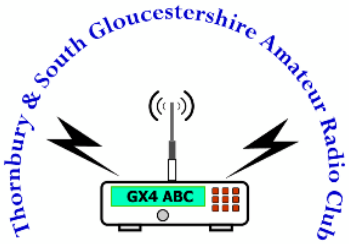
21-Feb-2018

M0ZMB

Agenda



- Arduino Software Setup
- Arduino Software Familiarisation
- Adding the NodeMCU Board
- Connecting UP
- Writing and uploading your first Sketch
- Modify Sketches
- Adding Libraries
- Running up the WiFi



Arduino Software Setup

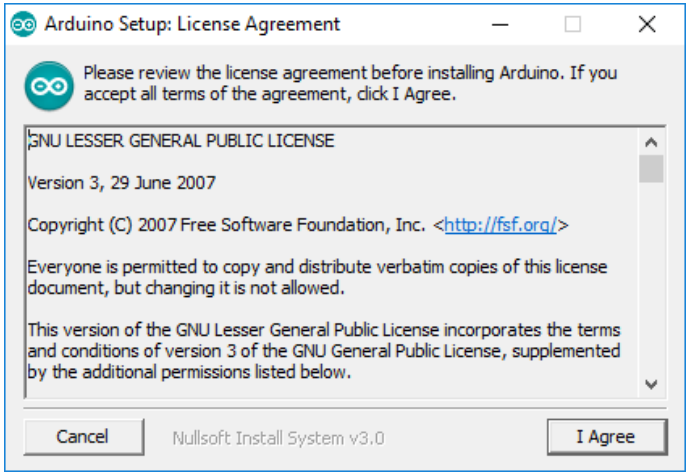
Arduino Software Setup 1/3

Double-click the Arduino installer

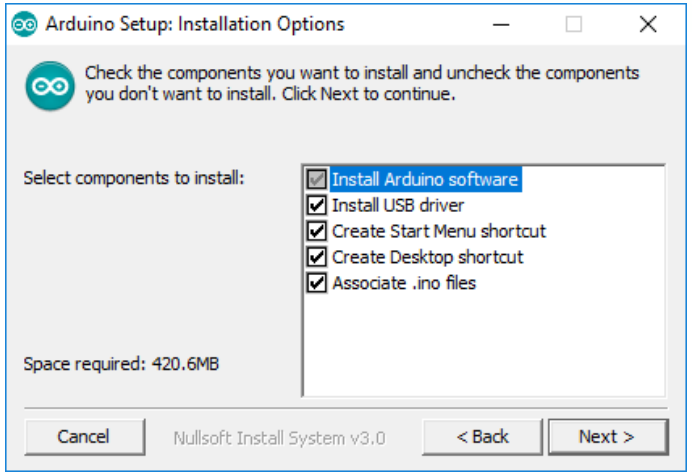
Accept any software warning

Arduino Software Setup 2/3

1.



2.



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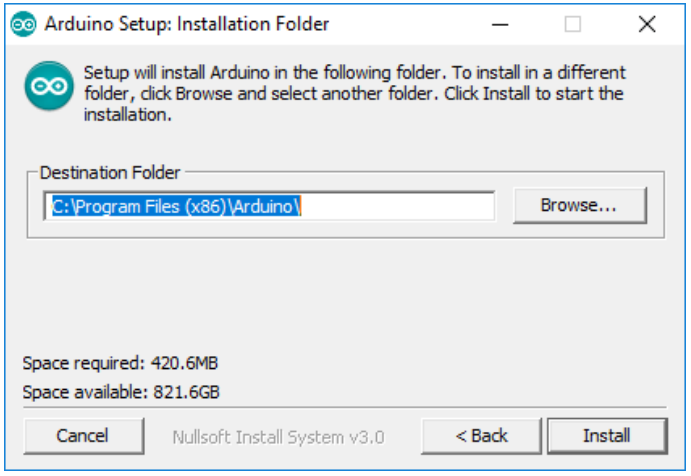

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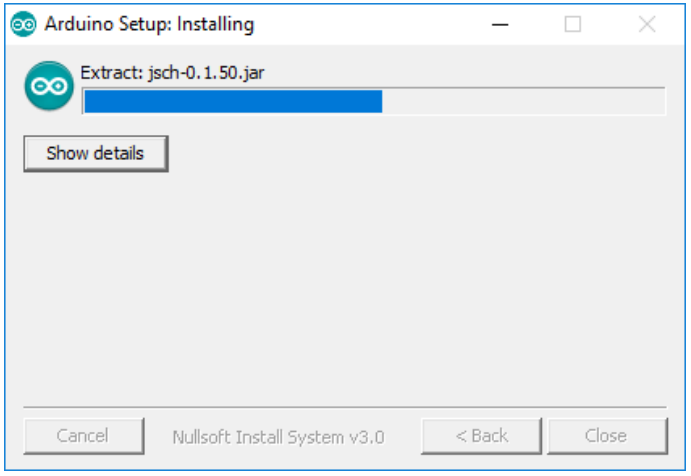
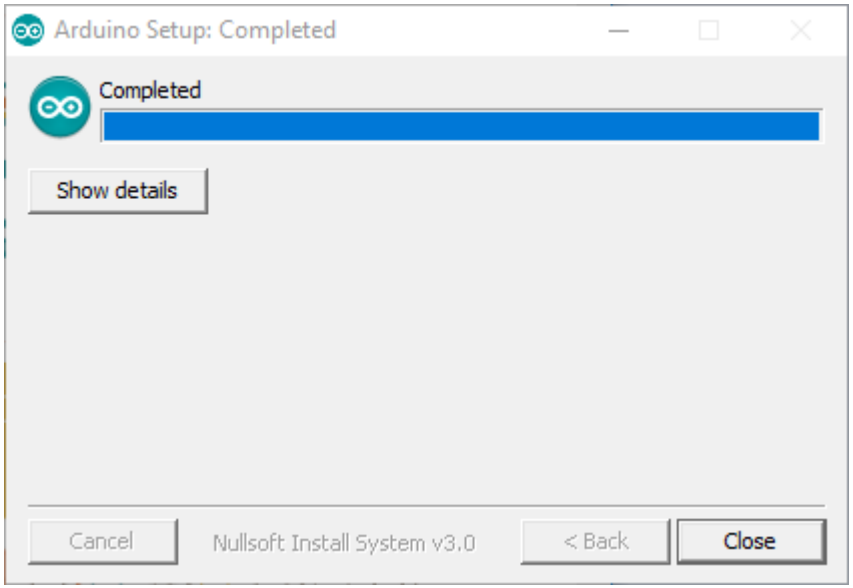


Arduino software setup 3/3

5.

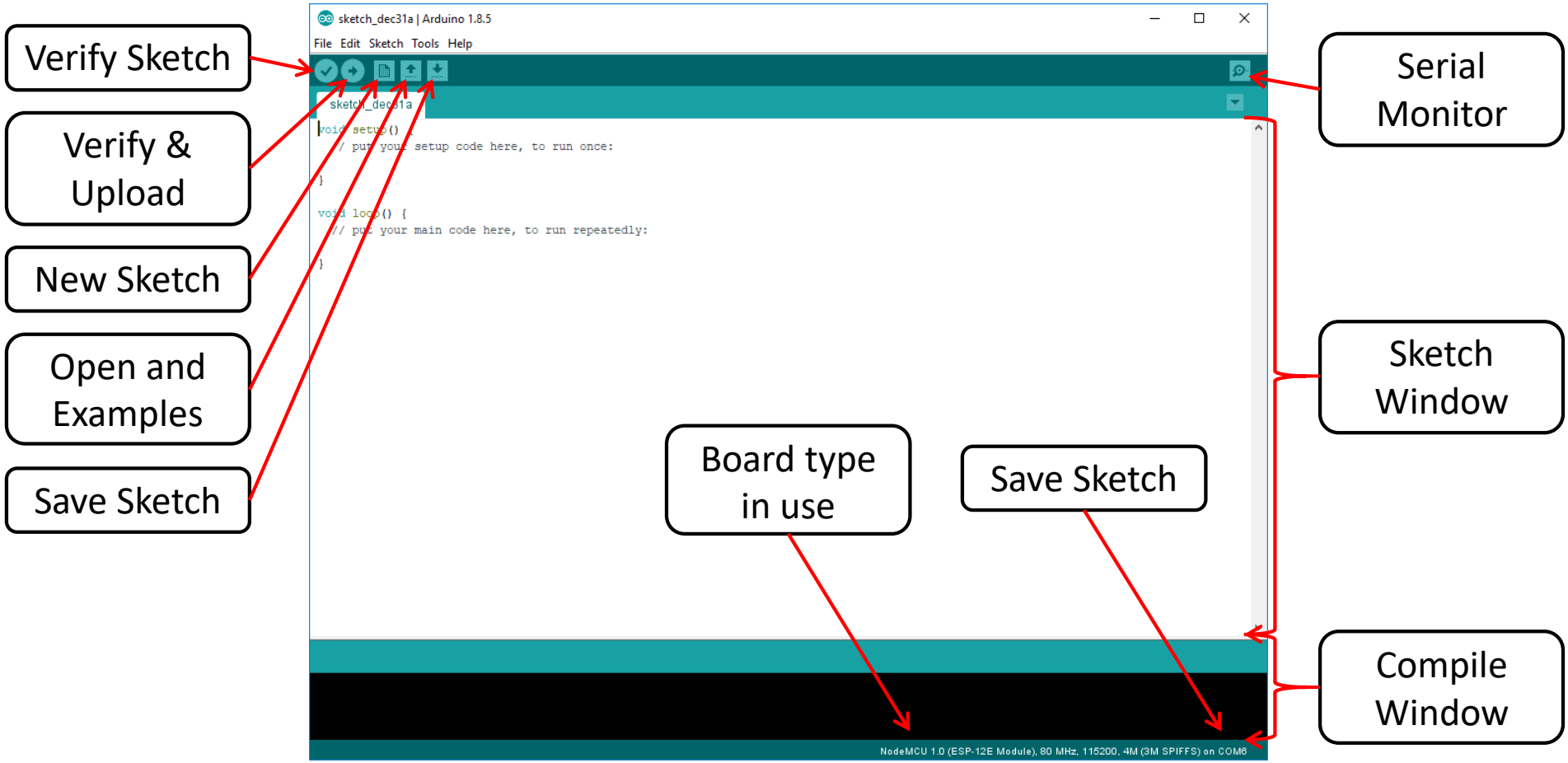


New Shortcut

Double Click to run

Arduino Software Familiarisation

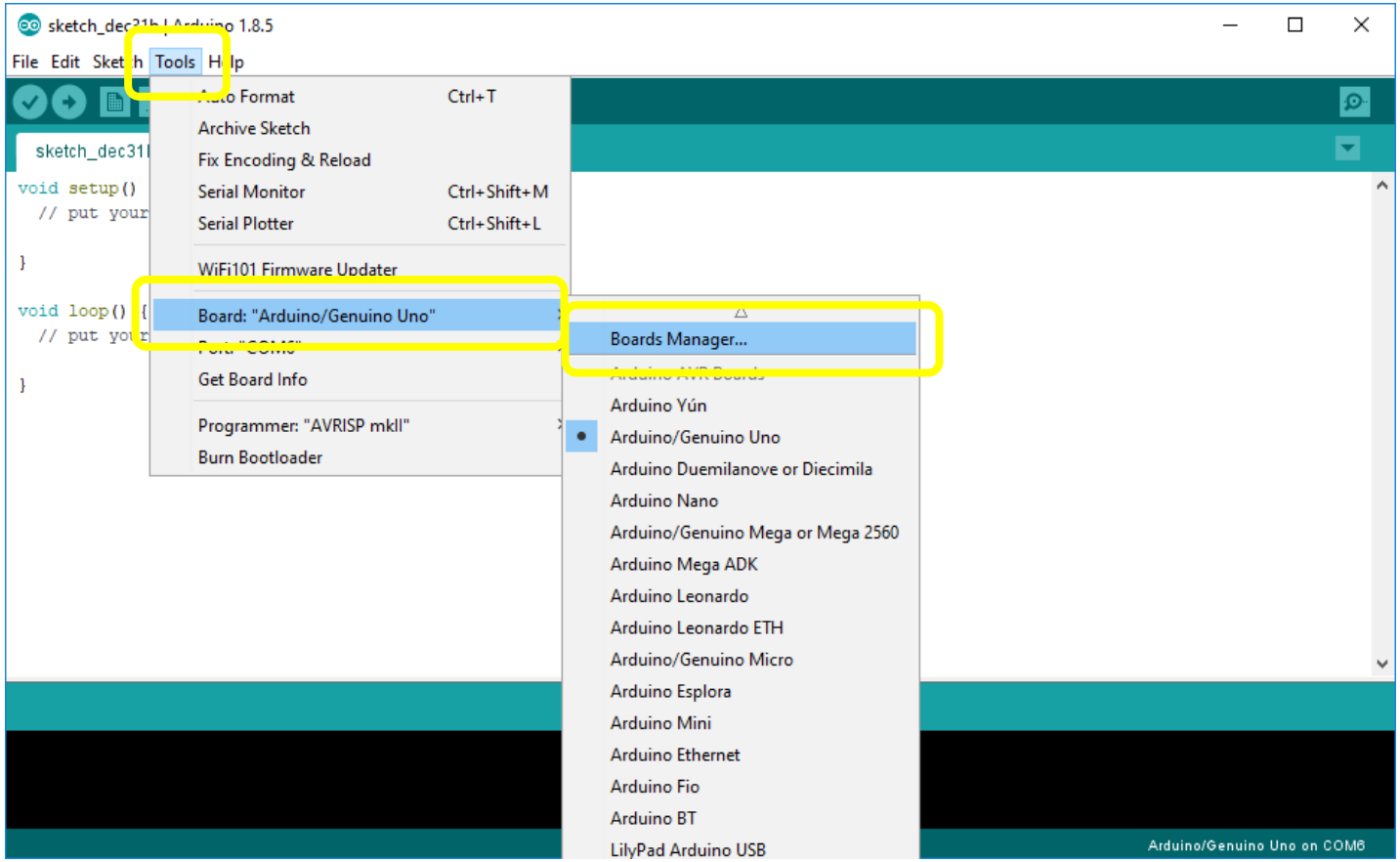
Arduino Software Familiarisation



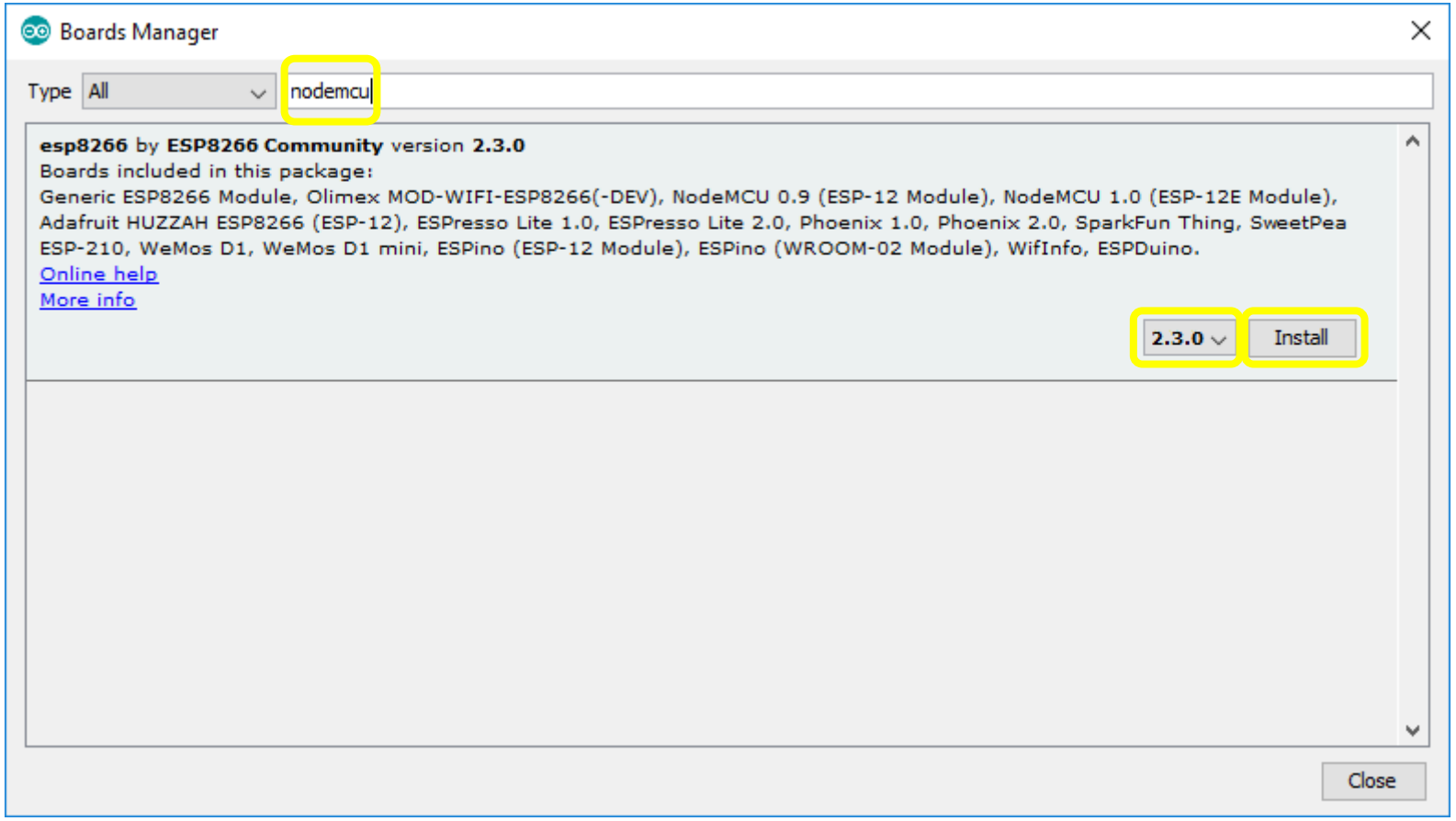
Adding Boards

Adding Boards 1/3

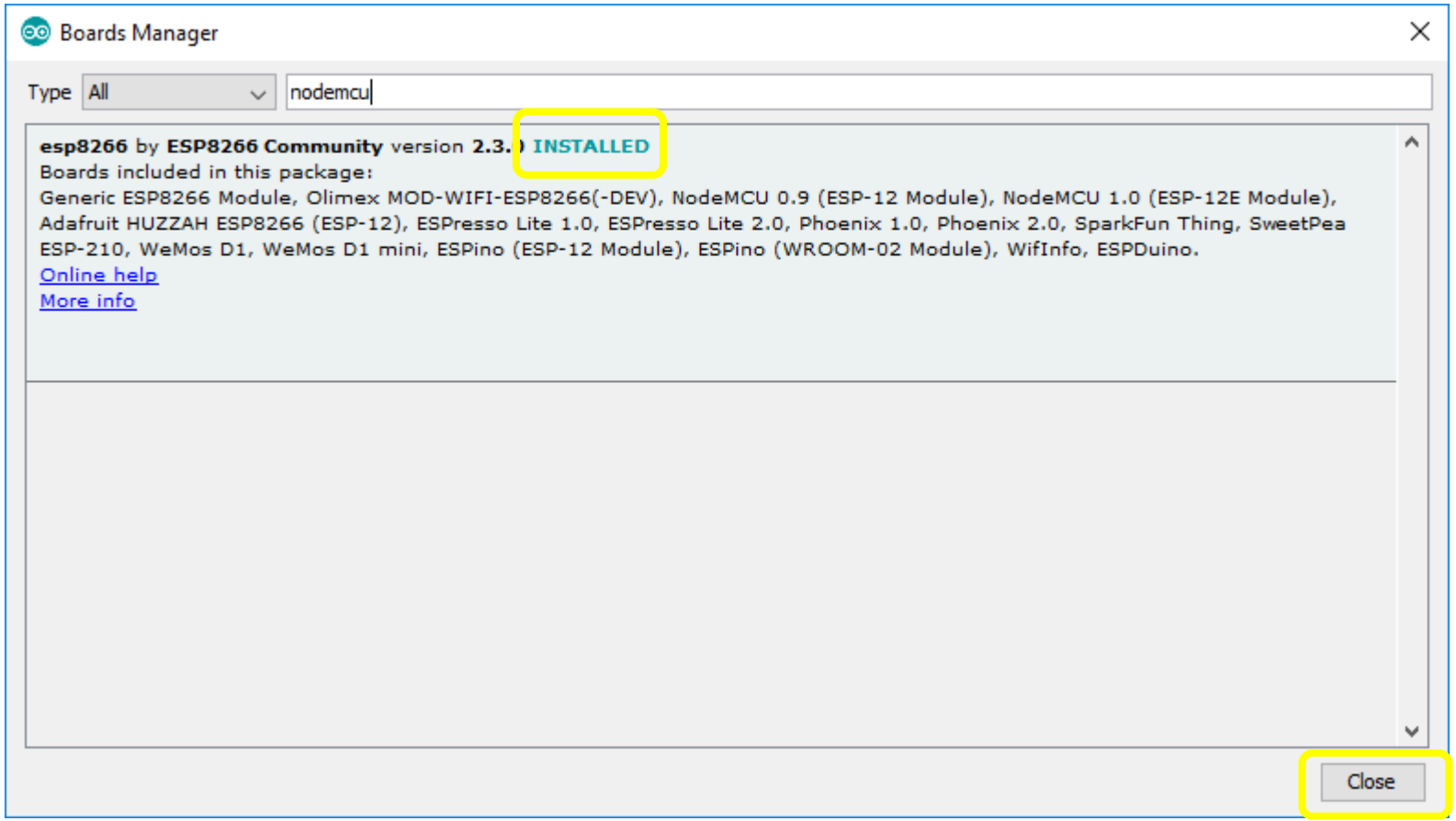
Menu: Tools/Board…/Boards Manager…



Adding Boards 2/3



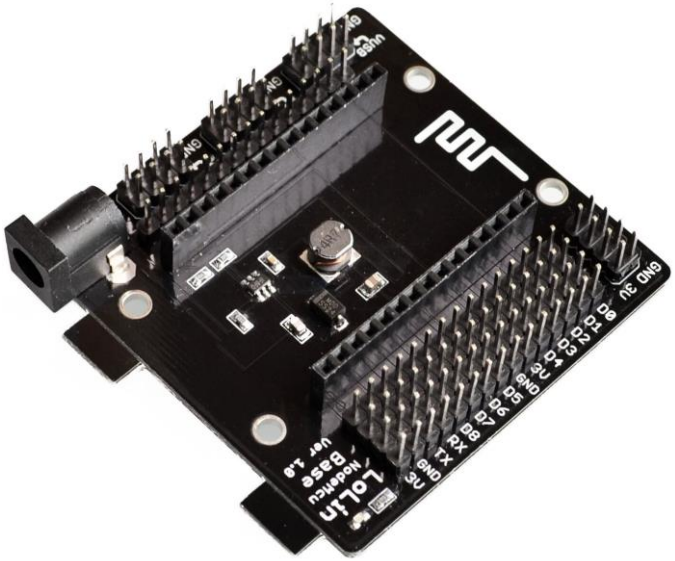
Adding Boards 3/3



Connecting Up

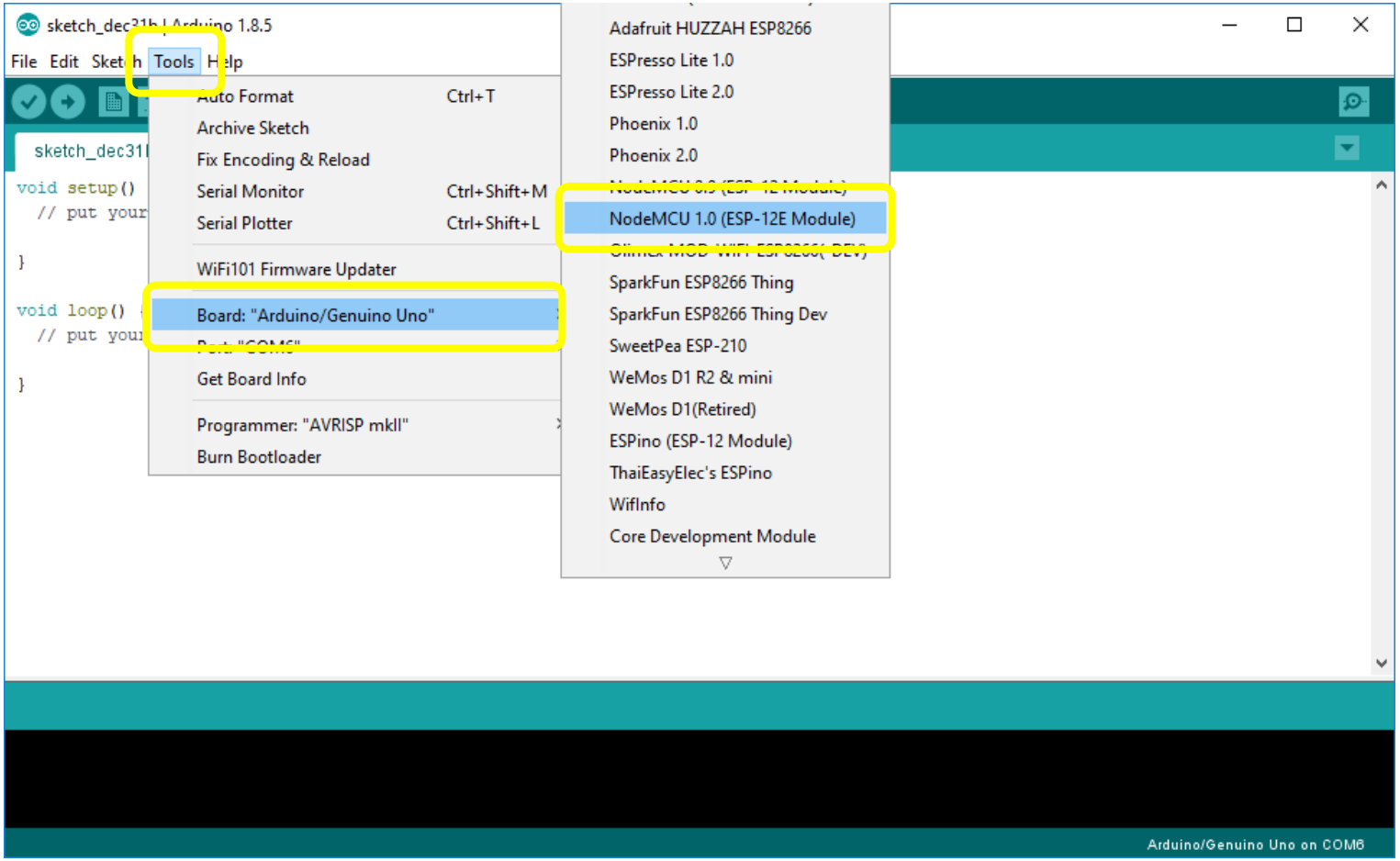
Connecting Up 1/4

- Plug your NodeMCU into the base and then a spare USB port on your Laptop/PC.



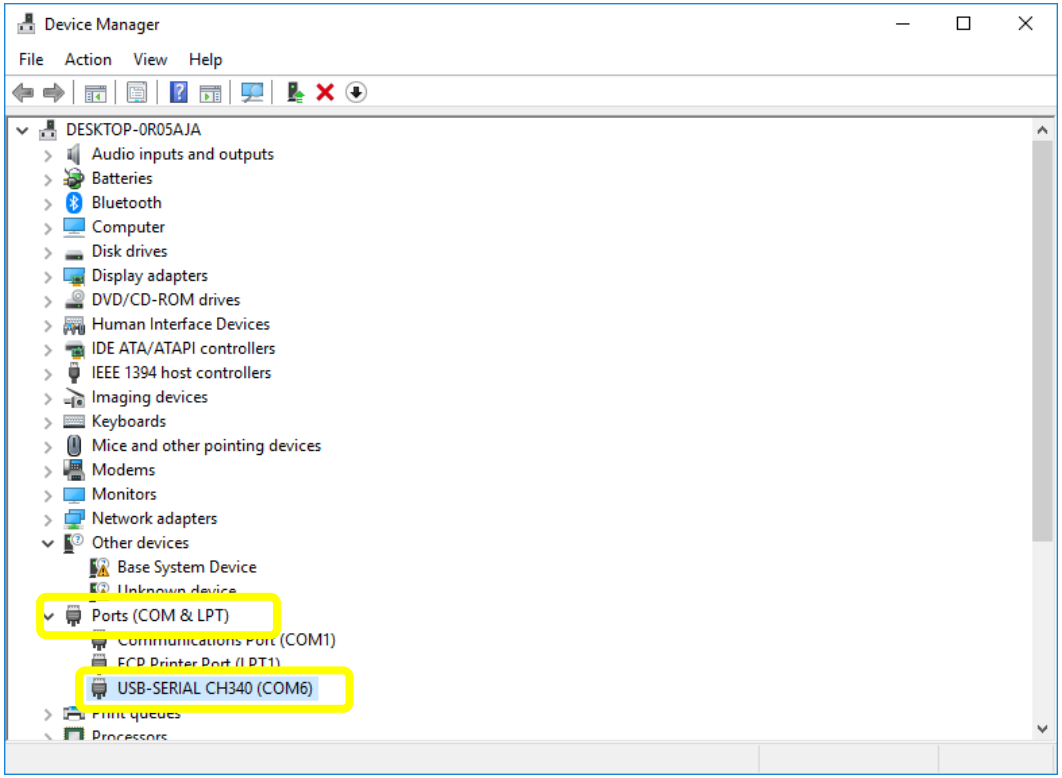
Connecting Up 2/4

Menu: Tools/Board…/NodeMCU 1.0 (ESP-12E Module)



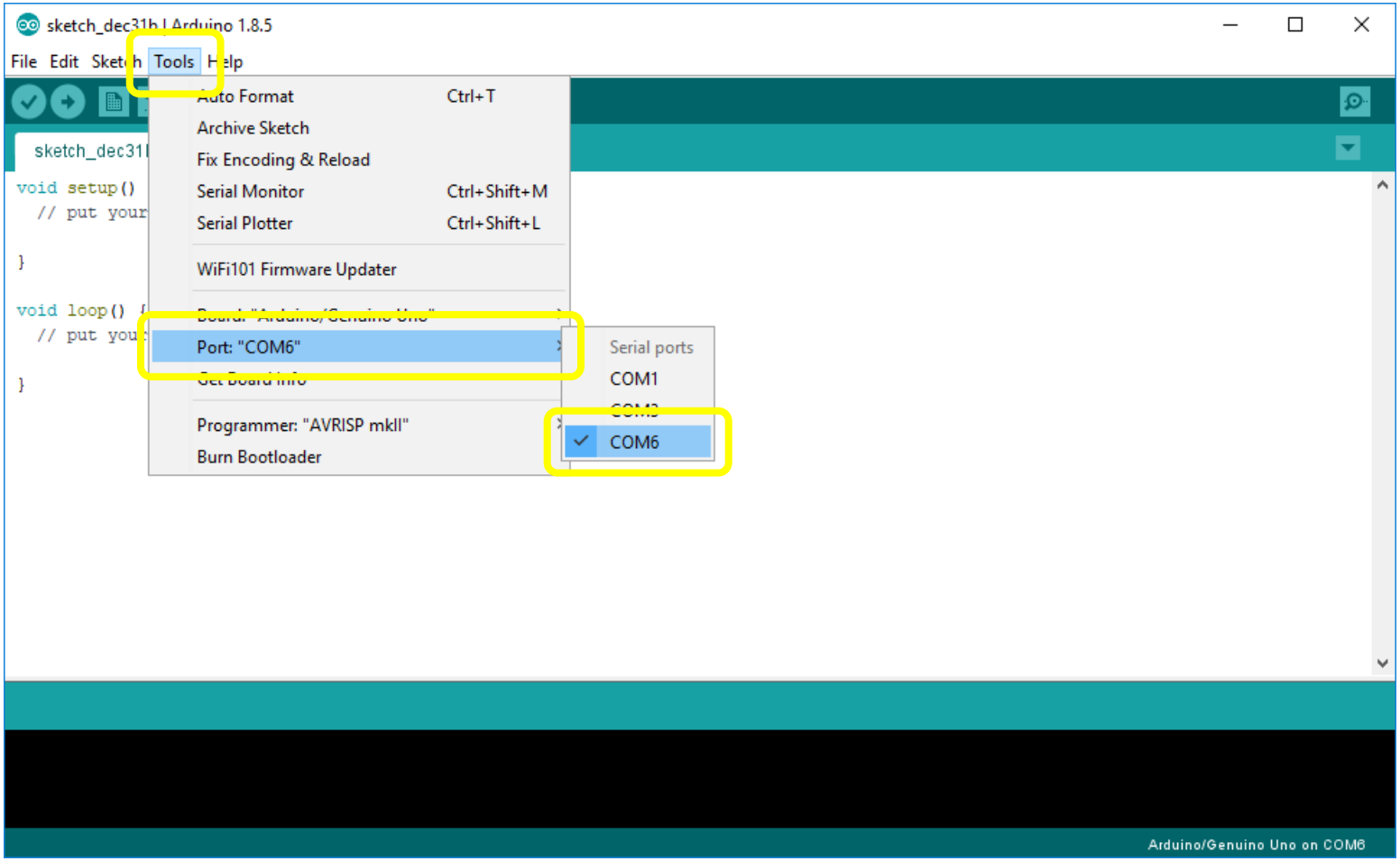
Connecting Up 3/4

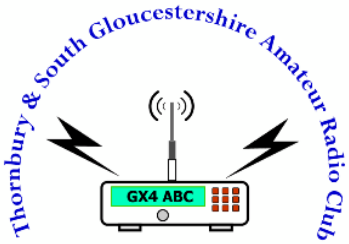
- Open Device Manager (Windows Key + X or via Control Panel)
- Expand Ports (COM & LPT
- Note the serial port for the USB-SERIAL CH340 interface



Connecting Up 4/4

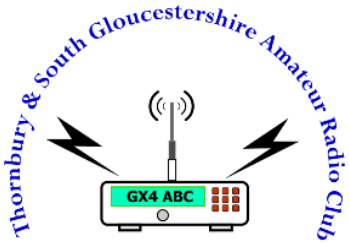
Menu: Tools/Port…/COMx (select you NodeMCU serial port)



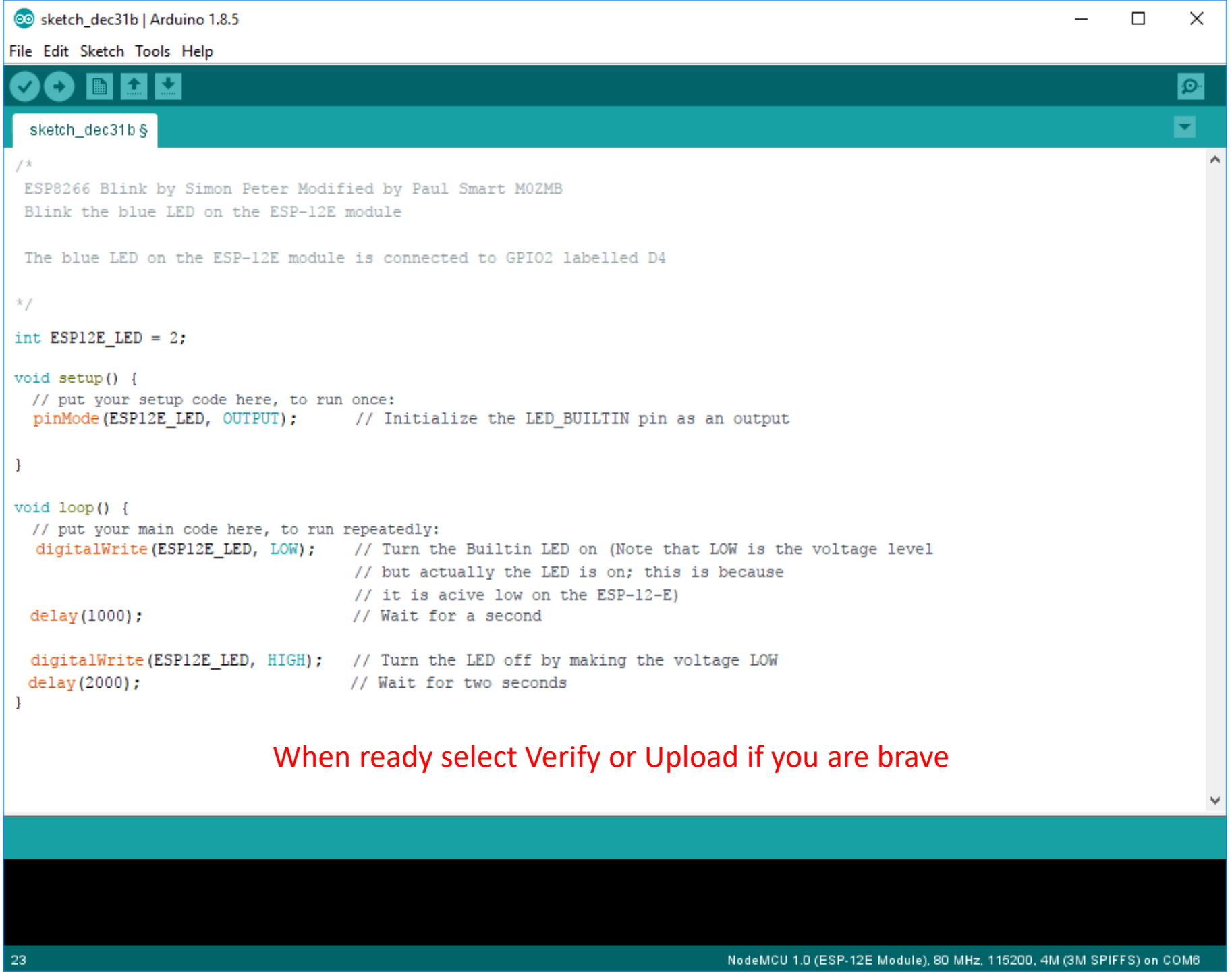


Writing and uploading your first Sketch

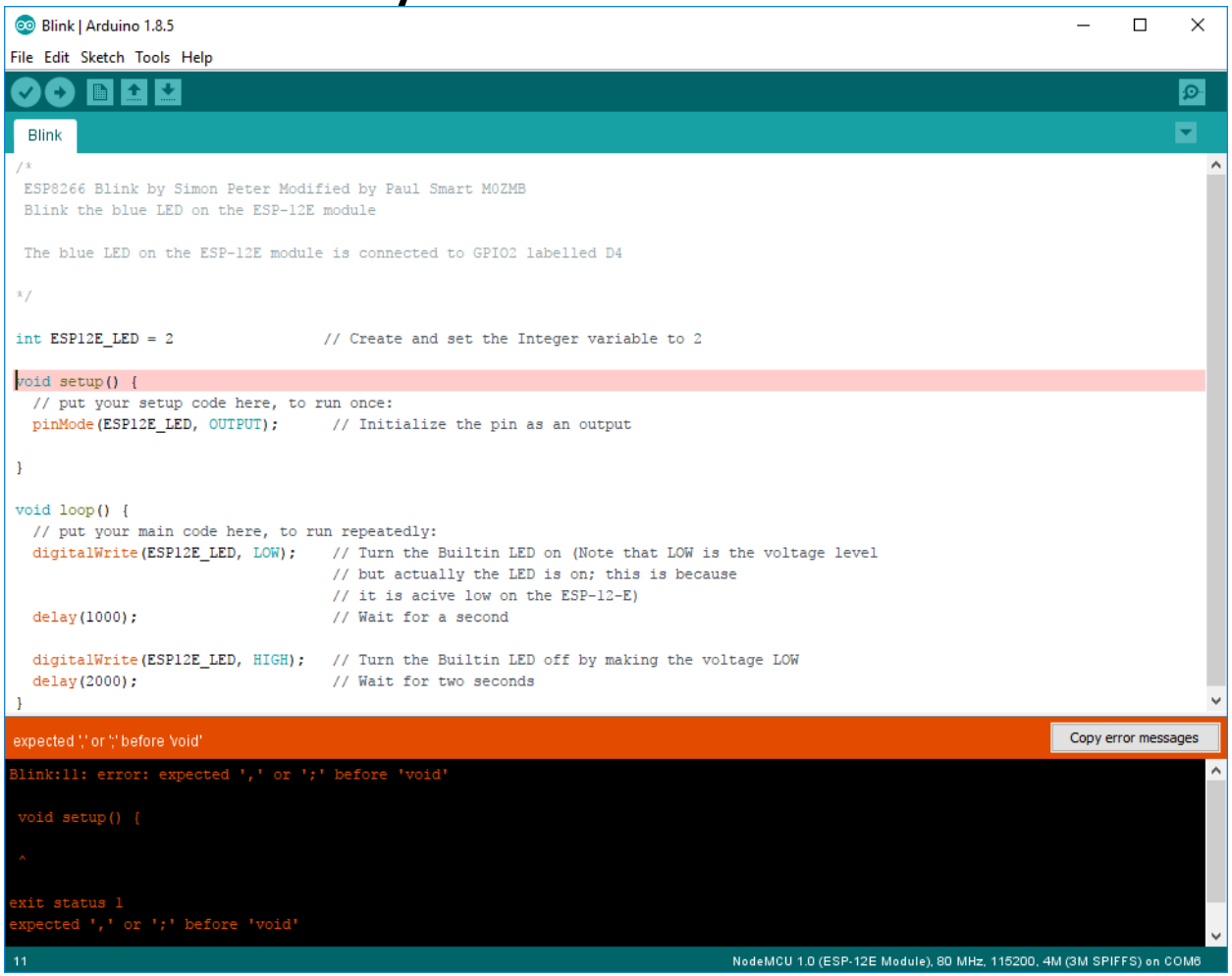
Writing and uploading your first Sketch 1/4



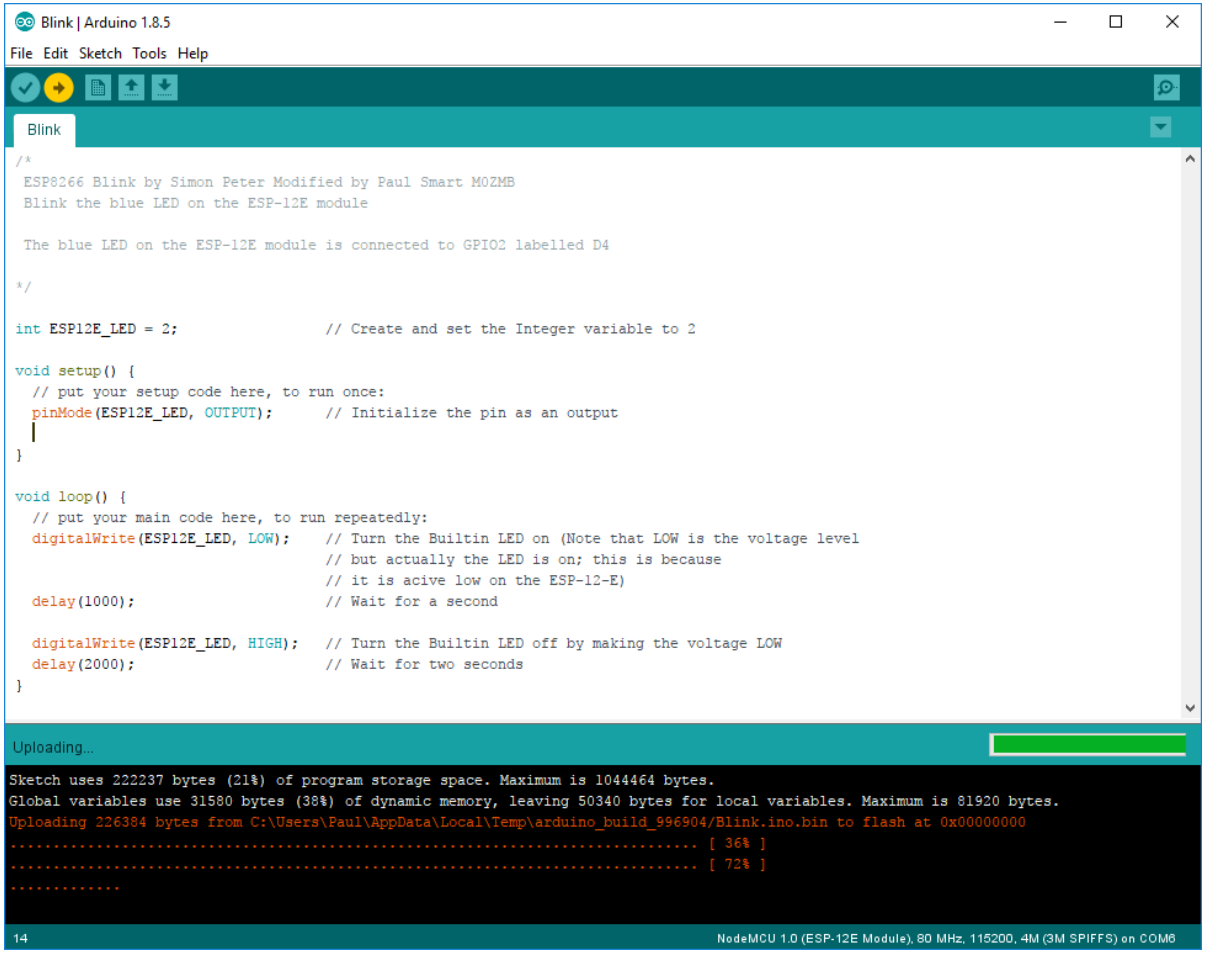
1. Setup Output pin
2. Turn our LED On
3. Delay for 1 second
4. Turn our LED off
5. Delay for 2 seconds


sketch_dec31b | Arduino 1.8.5
File Edit Sketch Tools Help
sketch_dec31b §
/*
ESP8266 Blink by Simon Peter Modified by Paul Smart M0ZMB
Blink the blue LED on the ESP-12E module
The blue LED on the ESP-12E module is connected to GPIO2 labelled D4
*/
int ESP12E_LED = 2;
void setup() {
// put your setup code here, to run once:
pinMode(ESP12E_LED, OUTPUT); // Initialize the LED_BUILTIN pin as an output
}
void loop() {
// put your main code here, to run repeatedly:
digitalWrite(ESP12E_LED, LOW); // Turn the Builtin LED on (Note that LOW is the voltage level
// but actually the LED is on; this is because
// it is acive low on the ESP-12-E)
delay(1000); // Wait for a second
digitalWrite(ESP12E_LED, HIGH); // Turn the LED off by making the voltage LOW
delay(2000); // Wait for two seconds
}
When ready select Verify or Upload if you are brave
23
NodeMCU 1.0 (ESP-12E Module), 80 MHz, 115200, 4M (3M SPIFFS) on COM6

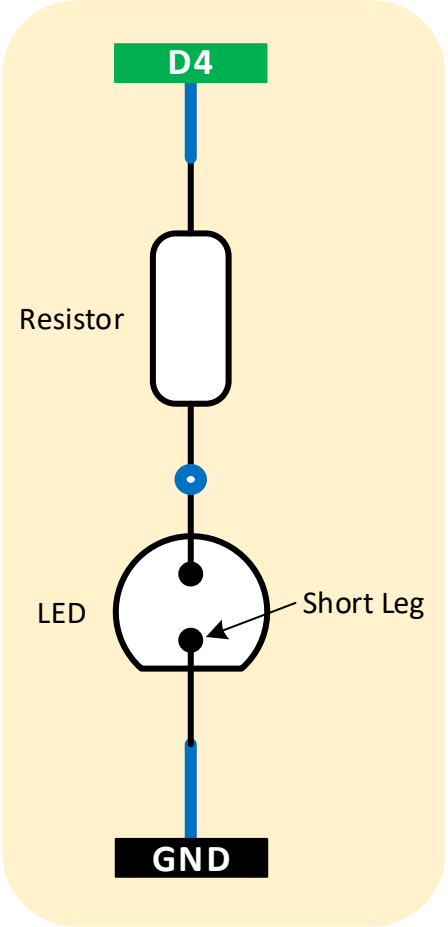
Writing and uploading your first Sketch 4/4



Writing and uploading your first Sketch 4/4

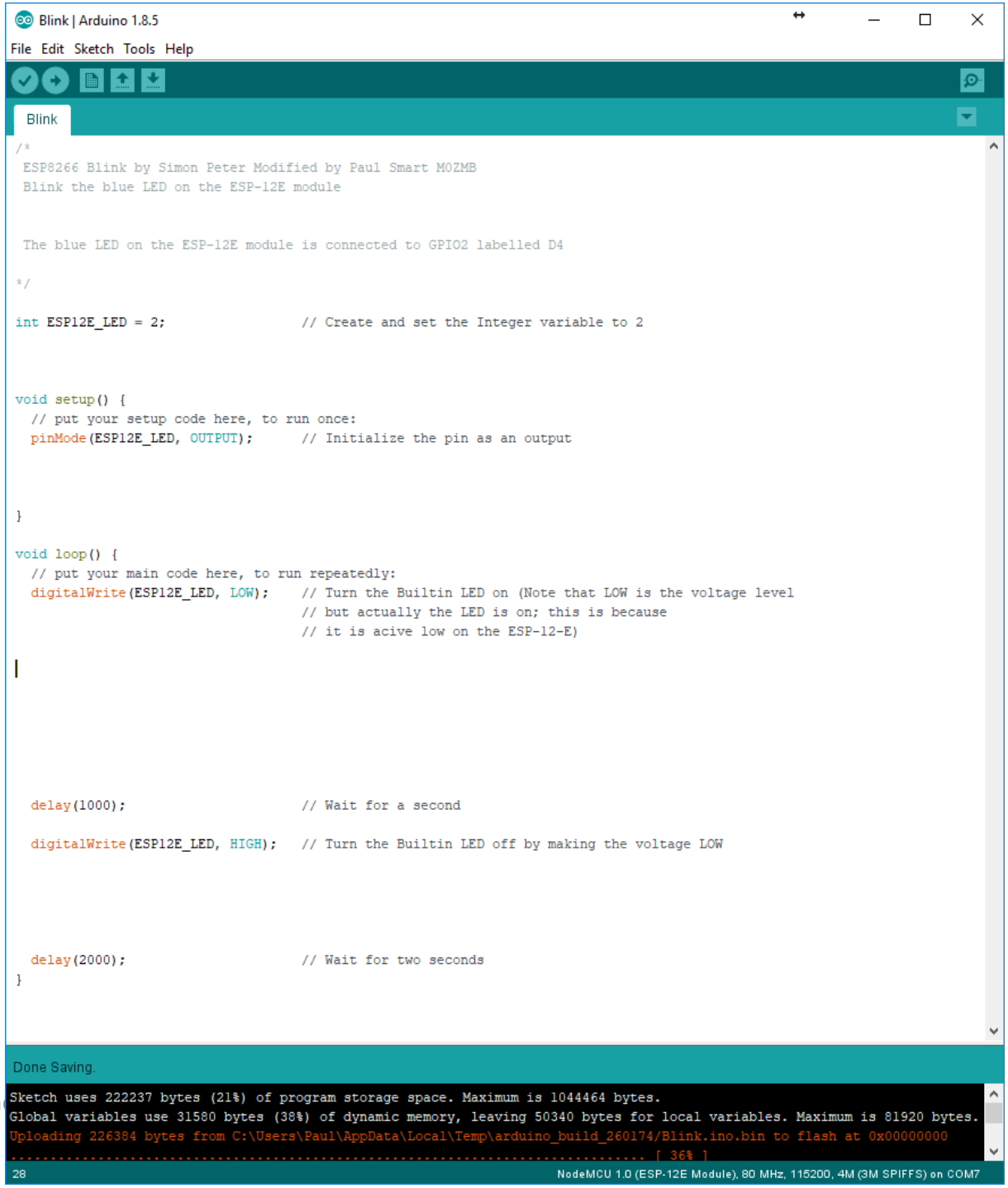


Connecting an LED



Modify

Modify 1/3


Blink | Arduino 1.8.5
File Edit Sketch Tools Help
Blink
/*
ESP8266 Blink by Simon Peter Modified by Paul Smart M0ZMB
Blink the blue LED on the ESP-12E module
The blue LED on the ESP-12E module is connected to GPIO2 labelled D4
*/
int ESP12E_LED = 2; // Create and set the Integer variable to 2
void setup() {
// put your setup code here, to run once:
pinMode(ESP12E_LED, OUTPUT); // Initialize the pin as an output
}
void loop() {
// put your main code here, to run repeatedly:
digitalWrite(ESP12E_LED, LOW); // Turn the Builtin LED on (Note that LOW is the voltage level
// but actually the LED is on; this is because
// it is acive low on the ESP-12-E)
delay(1000); // Wait for a second
digitalWrite(ESP12E_LED, HIGH); // Turn the Builtin LED off by making the voltage LOW
delay(2000); // Wait for two seconds
}
Done Saving.
Sketch uses 222237 bytes (21%) of program storage space. Maximum is 1044464 bytes.
Global variables use 31580 bytes (38%) of dynamic memory, leaving 50340 bytes for local variables. Maximum is 81920 bytes.
Uploading 226384 bytes from C:\Users\Paul\AppData\Local\Temp\arduino_build_260174/Blink.ino.bin to flash at 0x00000000
[36%]
28
NodeMCU 1.0 (ESP-12E Module), 80 MHz, 115200, 4M (3M SPIFFS) on COM7

Modify 2/3

```
int Speaker     = 14;
```

```
pinMode(Speaker, OUTPUT);
```

```
tone(Speaker,1500,1000);
```

```
tone(Speaker,1200,2000);
```

Tone | Arduino 1.8.5

File Edit Sketch Tools Help

Tone

```
/*
 ESP8266 Blink by Simon Peter Modified by Paul Smart M0ZMB
 Blink the blue LED on the ESP-12E module
 and play a two tone

 The blue LED on the ESP-12E module is connected to GPIO2 labelled D4

*/

int ESP12E_LED = 2;               // Create and set the Integer variable to 2 or pin D4
int Speaker    = 14;              // Create and set the Integer variable to 14 or pin D5


void setup() {
  // put your setup code here, to run once:
  pinMode(ESP12E_LED, OUTPUT);      // Initialize the pin as an output
  pinMode(Speaker, OUTPUT);         // Initialize the pin as an output


}

void loop() {
  // put your main code here, to run repeatedly:
  digitalWrite(ESP12E_LED, LOW);    // Turn the Builtin LED on (Note that LOW is the voltage level
                                    // but actually the LED is on; this is because
                                    // it is acive low on the ESP-12-E)


  tone(Speaker,1500,1000);          // Play a tone for 1 second



  delay(1000);                      // Wait for a second

  digitalWrite(ESP12E_LED, HIGH);   // Turn the Builtin LED off by making the voltage LOW


  tone(Speaker,1200,2000);          // Play a tone for 2 seconds


  delay(2000);                      // Wait for two seconds
}
```

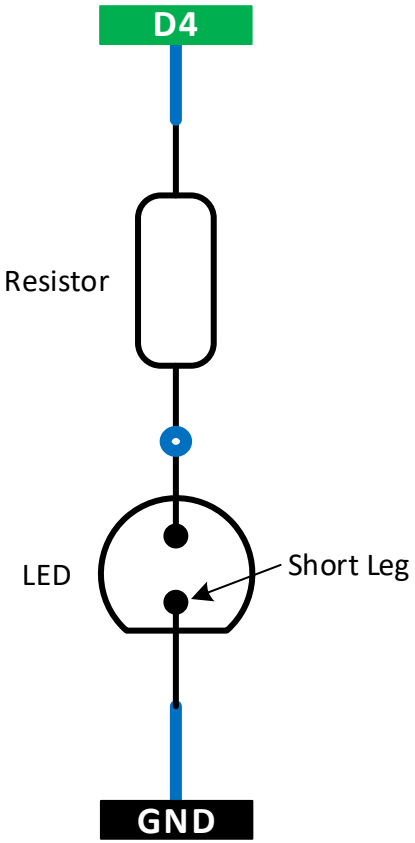
Done Saving.

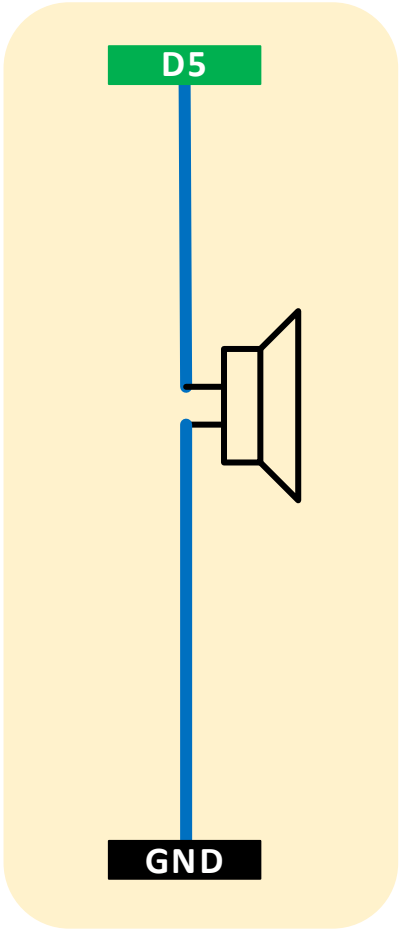
```
.......................................................................... [ 36% ]
.......................................................................... [ 72% ]
.....................................................                    [ 100% ]
```

11 NodeMCU 1.0 (ESP-12E Module), 80 MHz, 115200, 4M (3M SPIFFS) on COM7

Th

Connecting a Speaker





Modify 3/3

```
int Switch      = 16;
```

```
pinMode(Switch, INPUT);
```

```
if(digitalRead(Switch) == HIGH){
```

```
}
else {
noTone(Speaker);
}
```

```
if(digitalRead(Switch) == HIGH){
```

```
}
```

Switch | Arduino 1.8.5

File Edit Sketch Tools Help

Switch

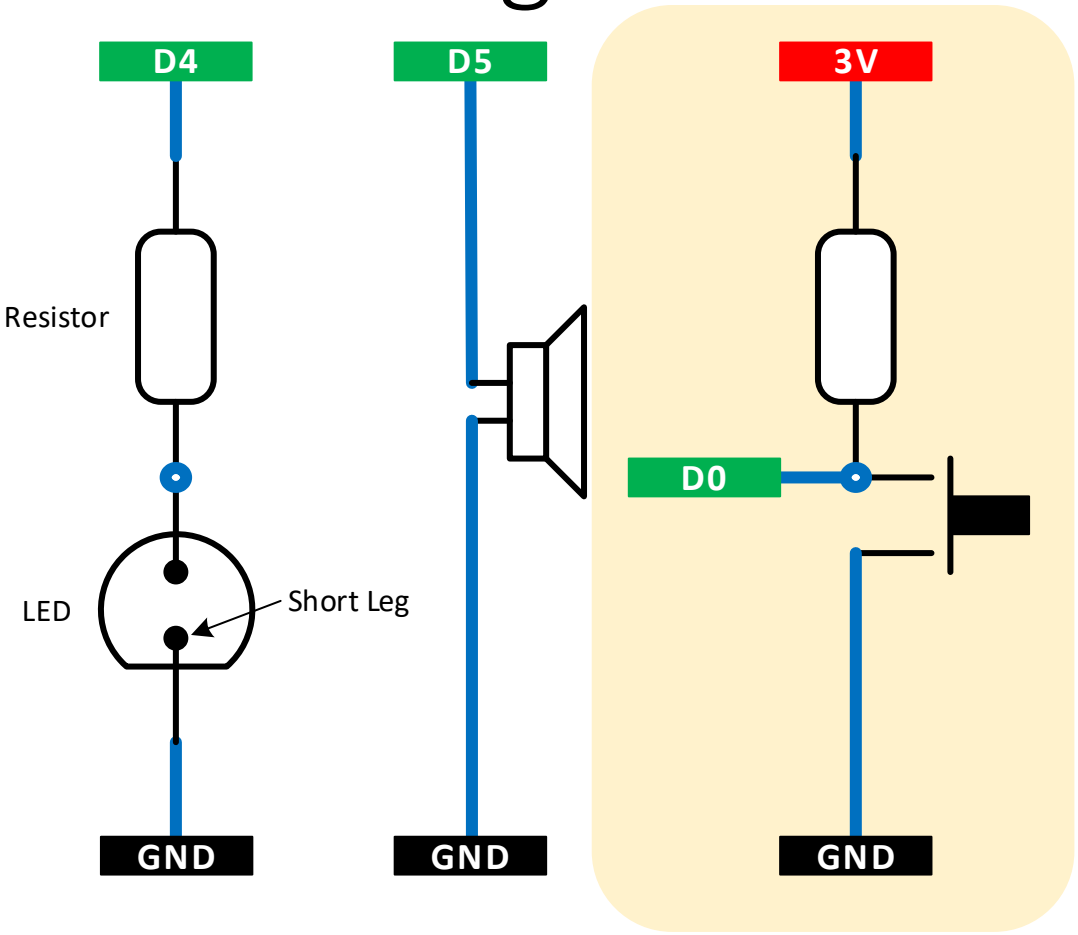
```
/*
 ESP8266 Blink by Simon Peter Modified by Paul Smart M0ZMB
 Blink the blue LED on the ESP-12E module
 and play a two tone controlled by a switch.

 The blue LED on the ESP-12E module is connected to GPIO2 labelled D4

*/

int ESP12E_LED = 2;               // Create and set the Integer variable to 2 or pin D4
int Speaker    = 14;              // Create and set the Integer variable to 14 or pin D5
int Switch     = 16;              // Create and set the Integer variable to 16 or pin D0

void setup() {
  // put your setup code here, to run once:
  pinMode(ESP12E_LED, OUTPUT);    // Initialize the pin as an output
  pinMode(Speaker, OUTPUT);       // Initialize the pin as an output
  pinMode(Switch, INPUT);         // Initialise the pin as an input

}

void loop() {
  // put your main code here, to run repeatedly:
  digitalWrite(ESP12E_LED, LOW);  // Turn the Builtin LED on (Note that LOW is the voltage level
                                  // but actually the LED is on; this is because
                                  // it is acive low on the ESP-12-E)

  if(digitalRead(Switch) == HIGH){  // If the switch is not pushed play the tone
  tone(Speaker,1500,1000);        // Play a tone for 1 second
  }
  else {
  noTone(Speaker);                // Turn all tones off
  }

  delay(1000);                    // Wait for a second

  digitalWrite(ESP12E_LED, HIGH); // Turn the Builtin LED off by making the voltage LOW

  if(digitalRead(Switch) == HIGH){
  tone(Speaker,1200,2000);        // Play a tone for 2 seconds
  }

  delay(2000);                    // Wait for two seconds
}
```

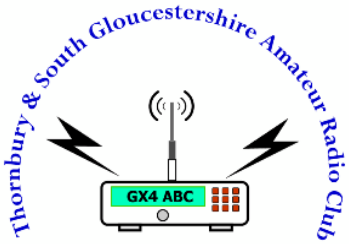
Done uploading.

```
..... [ 36% ]
..... [ 72% ]
..... [ 100% ]
```

16 NodeMCU 1.0 (ESP-12E Module), 80 MHz, 115200, 4M (3M SPIFFS) on COM7

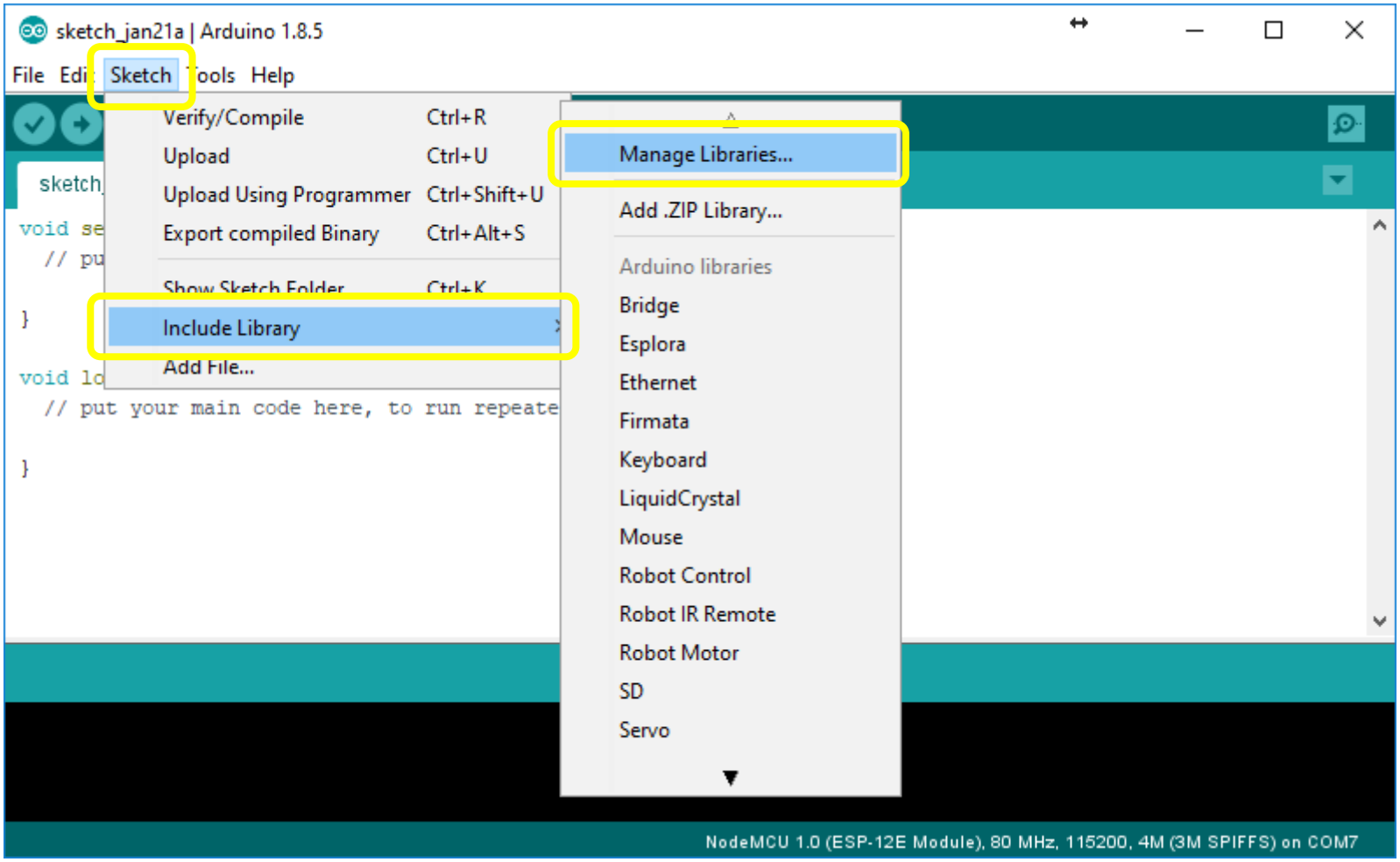
Connecting a Switch



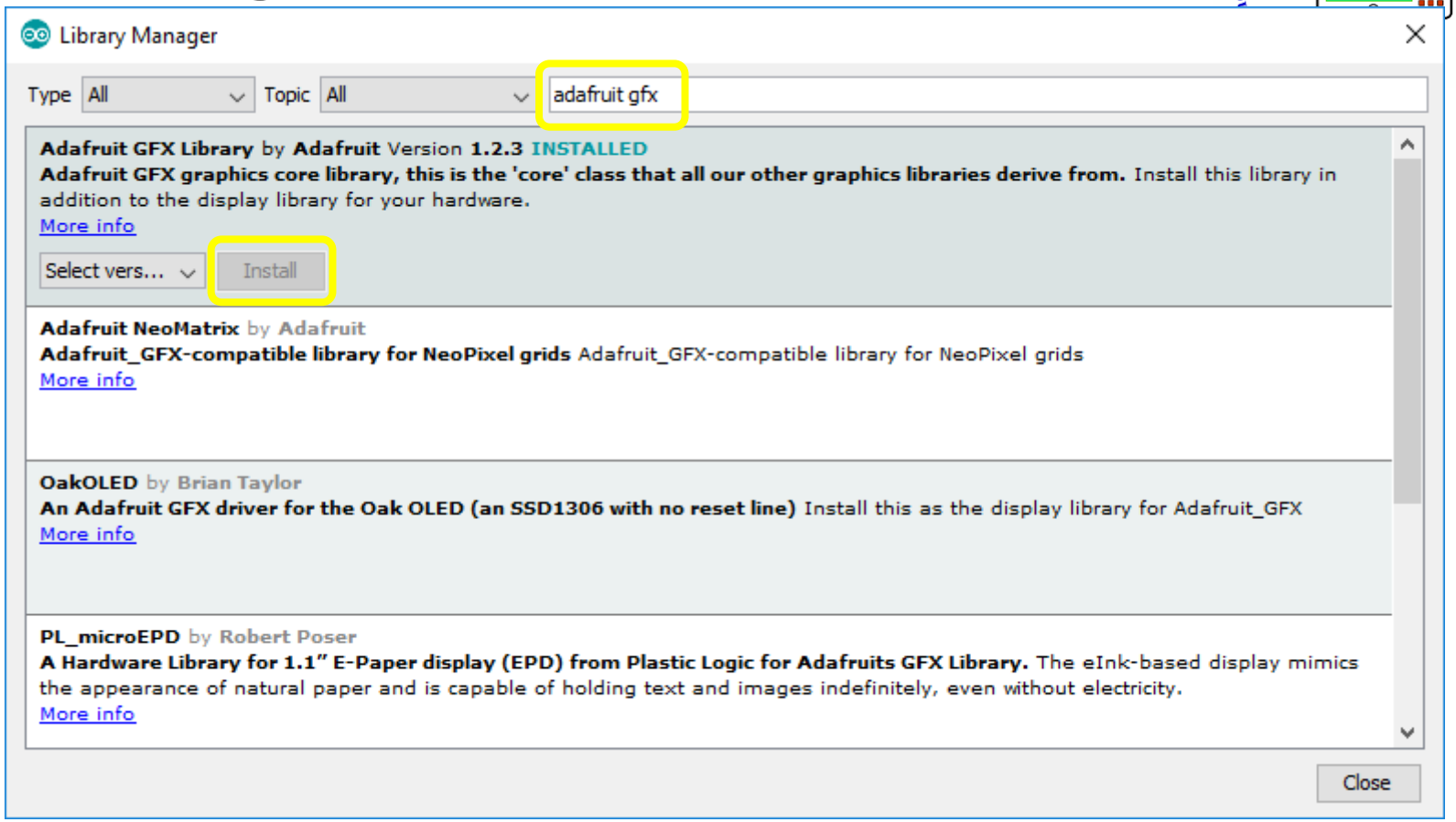


Adding Libraries

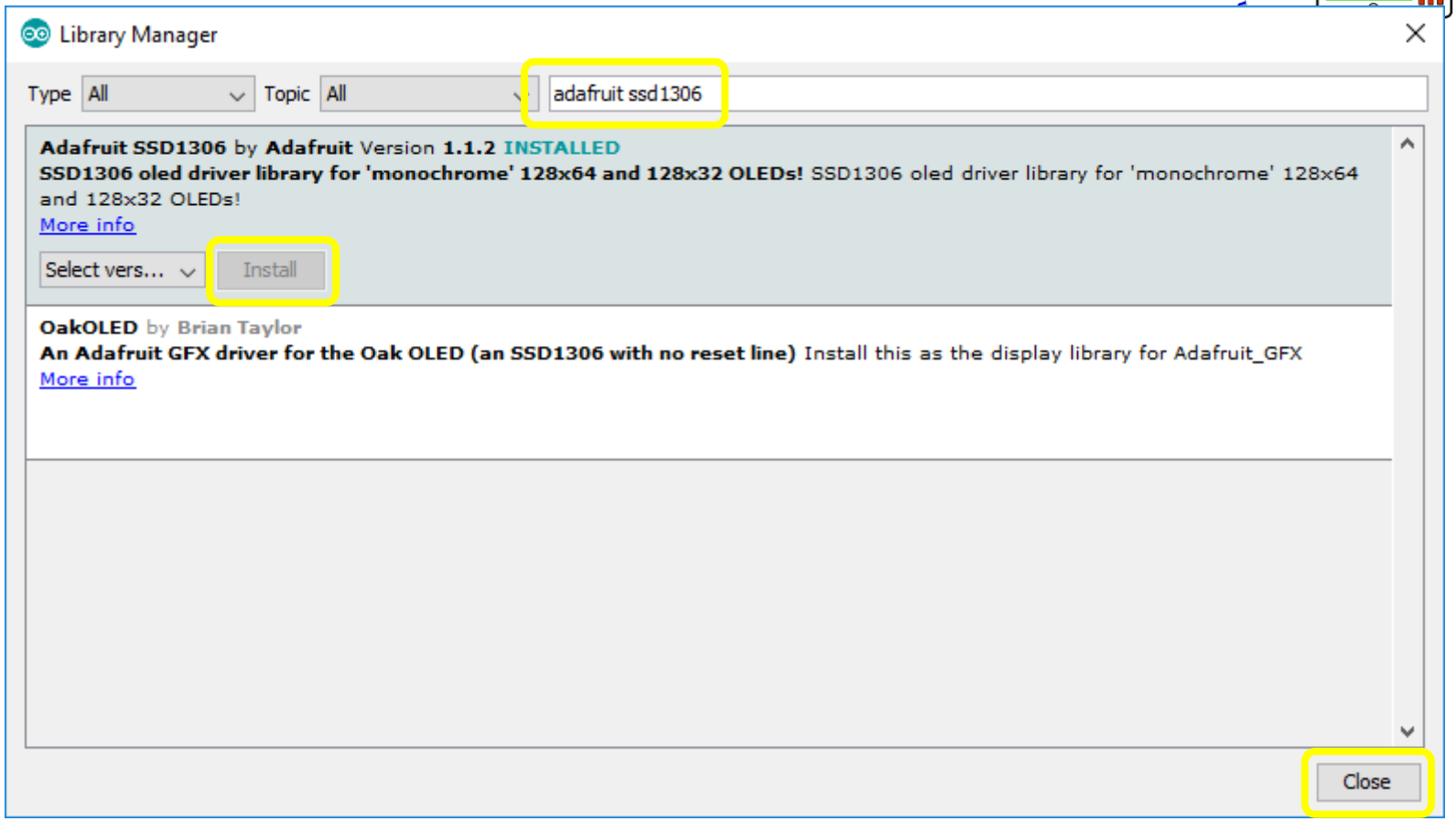
Adding Libraries 1/3

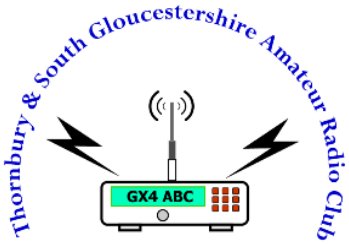


Adding Libraries 2/3



Adding Libraries 3/3

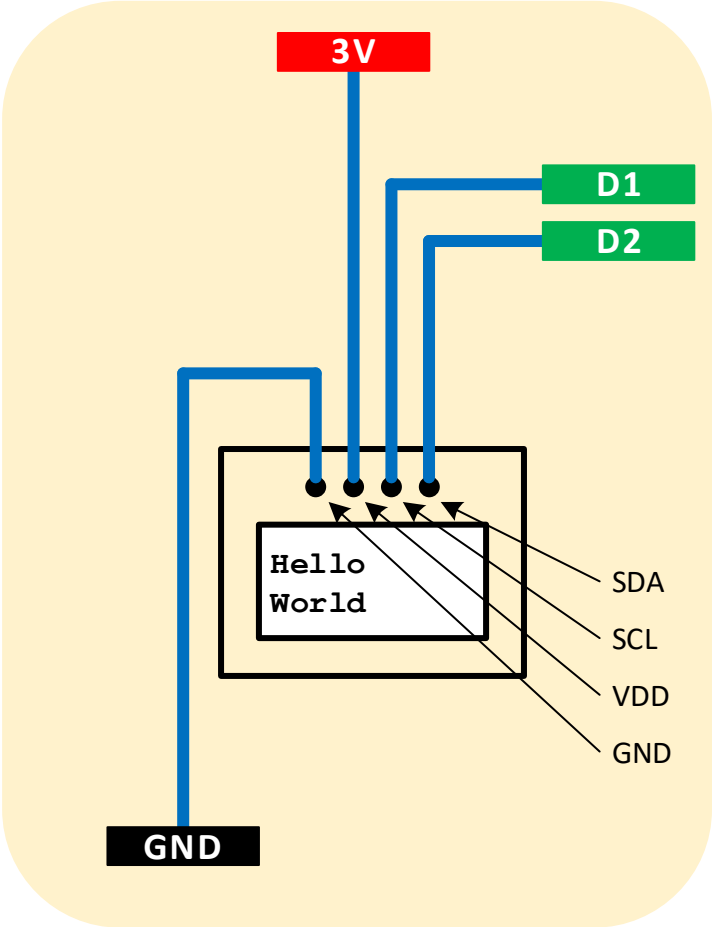




Running up the WiFi

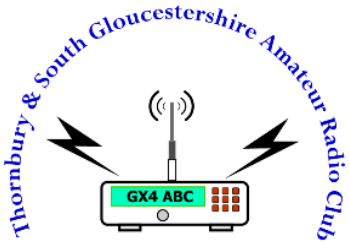
Running up the WiFi

Running up the WiFi



References & Links

[ARDU] - Arduino : https://www.arduino.cc/



The End

Thank you