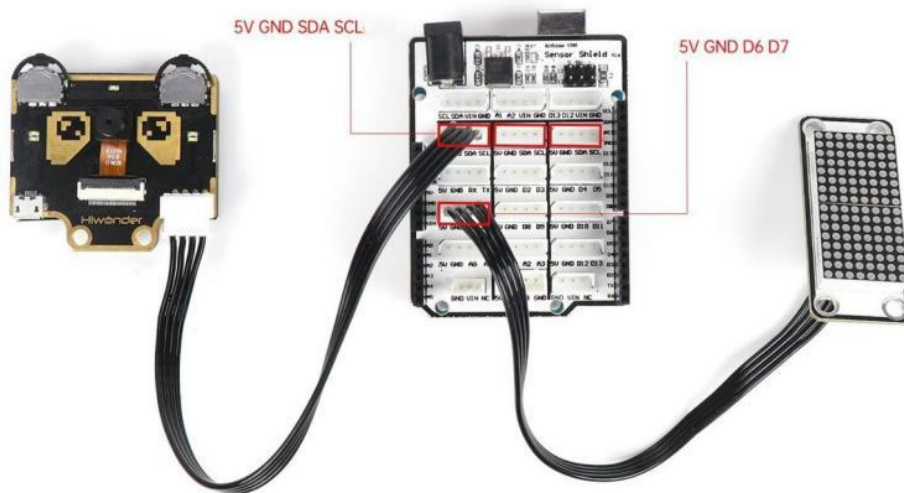# Lesson 3 Tag Recognition Integration with Arduino

1. Preparation

Connect WonderCam and Dot Matrix Display Module to Arduino Expansion Board using 4-Pin cable.

Dot Matrix Display Module connects to port (5V GND D6 D7).

WonderCam can be connected to any IIC port (5V GND SDA SCL).

2. Learning Objectives

① To know the connectivity of WonderCam and Dot Matrix Display Module on Arduino Expansion Board.

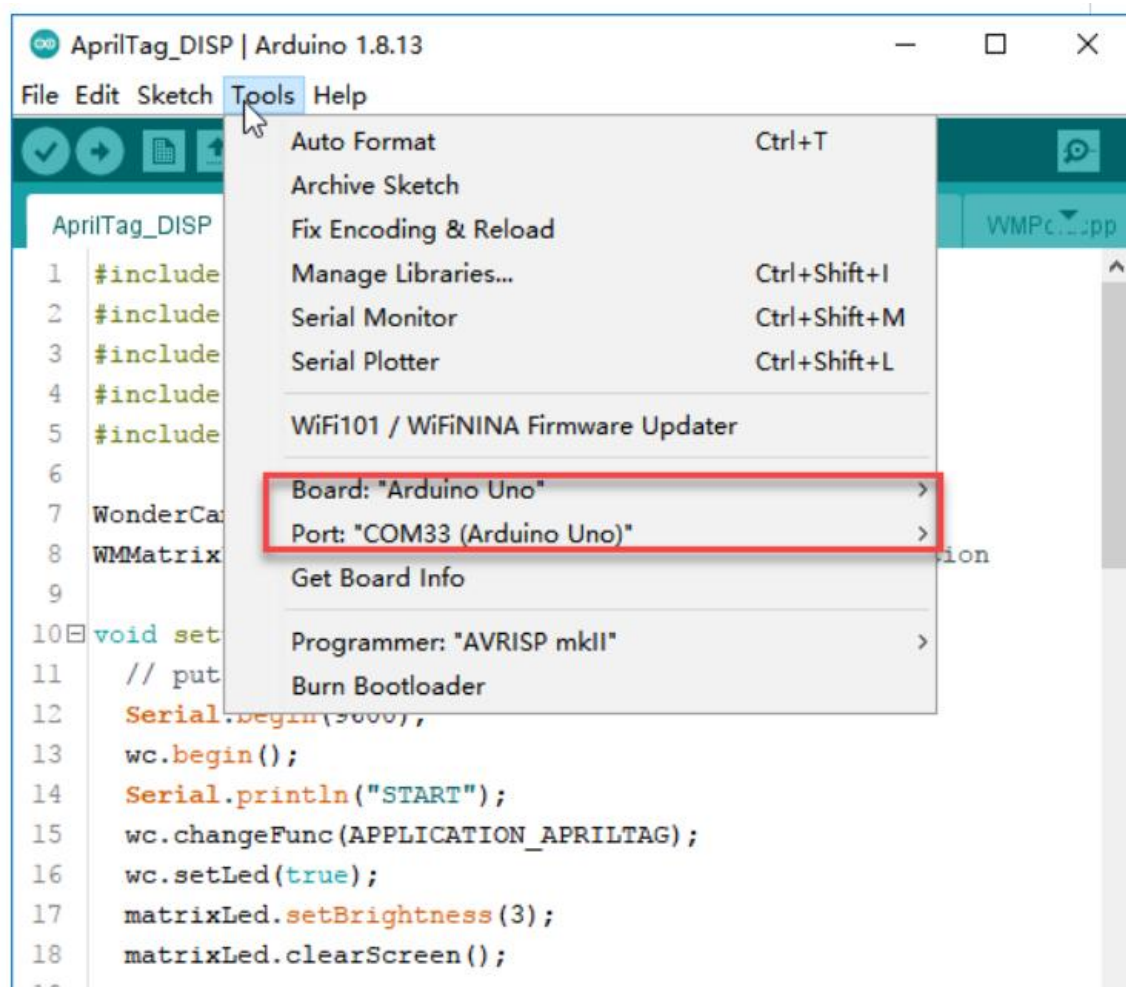② To understand the program logic.

3. Programming Plan

In this lesson, we are using the Visual module Tag Recognition function to integrate with Arduino to conduct Tag Recognition. The program will initialize the Visual module follow by detecting tag. When tag is detected, it will proceed to identify the tag and present the corresponding tag ID on Dot Matrix Display module.
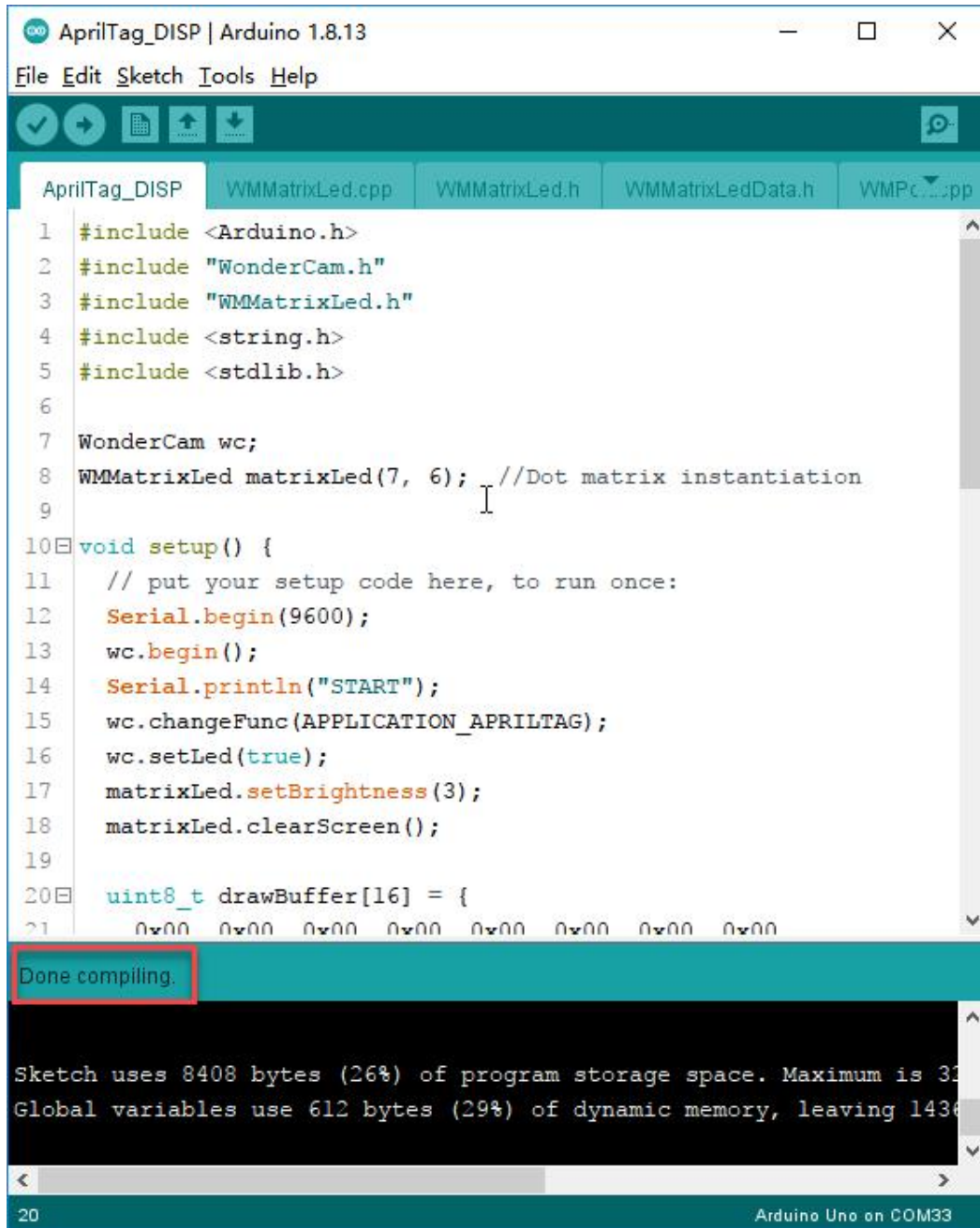
4. Compiling Program and Upload

ℹ This full program code can be found in folder "Tag Recognition Arduino Program" in "07_AprilTag_DISP".

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1) Connect Arduino UNO board to computer.

2) In folder "Tag Recognition Arduino Program" in "07_AprilTag_DISP", double click ino program.

3) In Arduino IDE program, open Tools in menu and select corresponding Development Board and port. (Port number shown in this lesson may differs in individual computer environment).

4) In Arduino IDE Program, click ✓ button on the menu and wait for compilation process to complete.

```
AprilTag_DISP | Arduino 1.8.13                           —    □    ×
File Edit Sketch Tools Help

AprilTag_DISP   WMMatrixLed.cpp   WMMatrixLed.h   WMMatrixLedData.h   WMPc...pp

 1  #include <Arduino.h>
 2  #include "WonderCam.h"
 3  #include "WMMatrixLed.h"
 4  #include <string.h>
 5  #include <stdlib.h>
 6
 7  WonderCam wc;
 8  WMMatrixLed matrixLed(7, 6);   //Dot matrix instantiation
 9
10  void setup() {
11    // put your setup code here, to run once:
12    Serial.begin(9600);
13    wc.begin();
14    Serial.println("START");
15    wc.changeFunc(APPLICATION_APRILTAG);
16    wc.setLed(true);
17    matrixLed.setBrightness(3);
18    matrixLed.clearScreen();
19
20    uint8_t drawBuffer[16] = {
21      0x00  0x00  0x00  0x00  0x00  0x00  0x00  0x00

Done compiling.

Sketch uses 8408 bytes (26%) of program storage space. Maximum is 3
Global variables use 612 bytes (29%) of dynamic memory, leaving 143

20                                          Arduino Uno on COM33
```
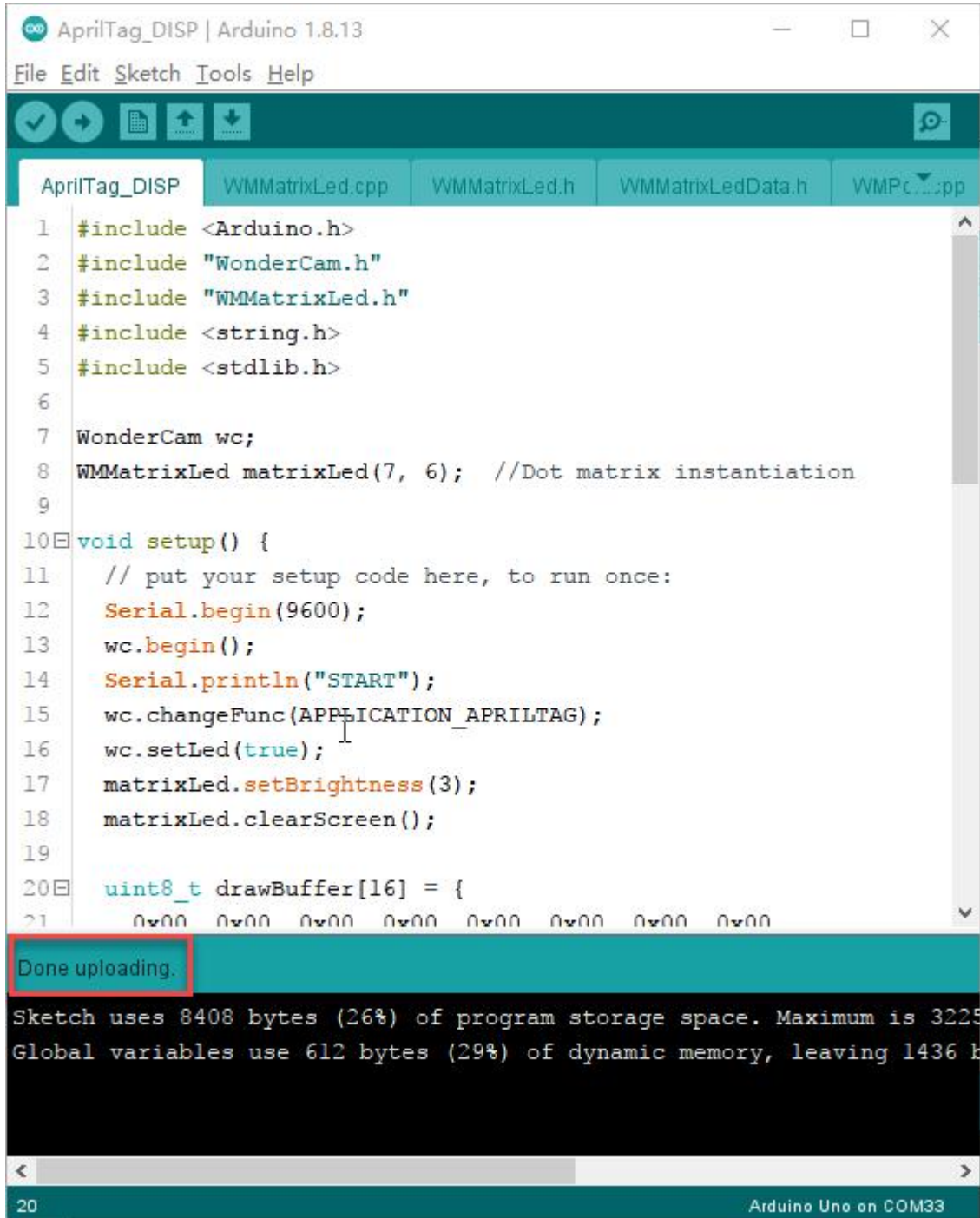
ℹ During Uploading process, do not unplug or move the USB Cable to prevent transmission failure.

5) Click ⬆ button to upload program to UNO Development Board. Wait for uploading process to complete.

5. Results

Please use the AprilTags provided in folder name "April Tags Collection".

Once program had been uploaded, WonderCam will automatically switch to Tag Recognition interface. When tag are detected and identified, tag ID will be displayed on Dot Matrix Display module.