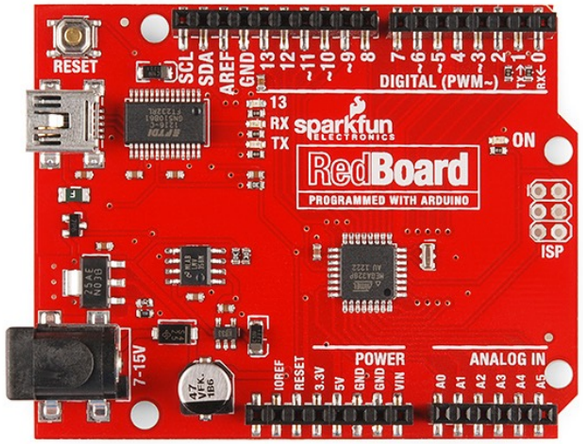
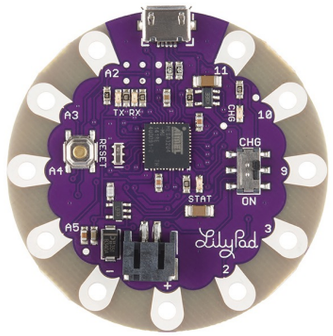
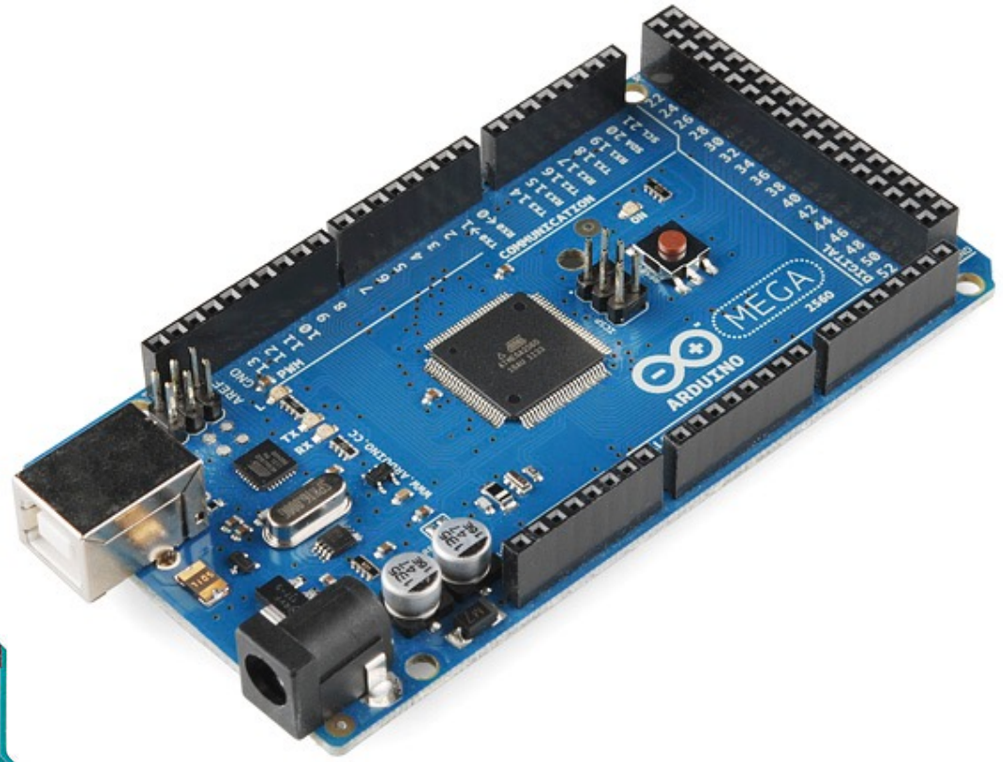
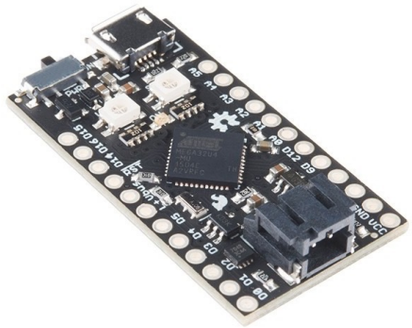
Arduino + Intro to Microcontrollers

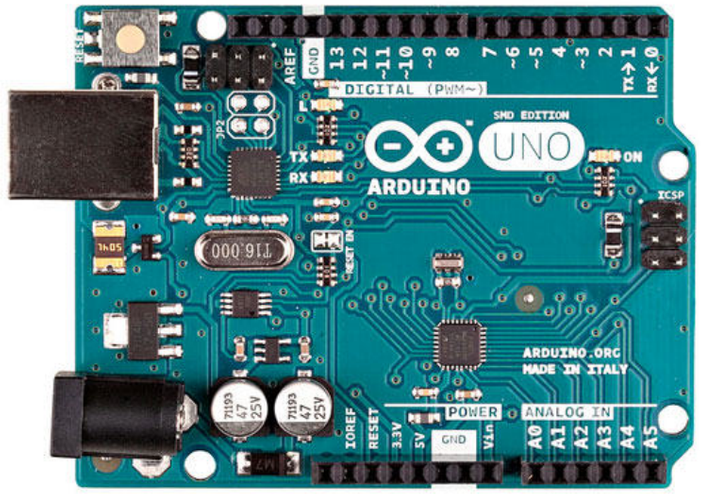
A **microcontroller** is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals.

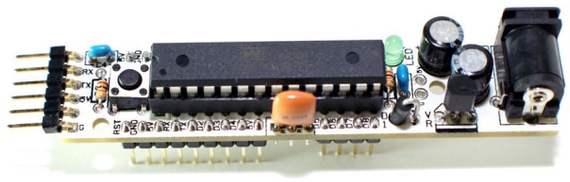

RESET
SCL
SDA
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
13
RX
TX
sparkfun
ELECTRONICS
RedBoard
PROGRAMMED WITH ARDUINO
ON
ISP
7-15V
IOREF
RESET
3.3V
5V
GND
GND
VIN
POWER
ANALOG IN
A0
A1
A2
A3
A4
A5

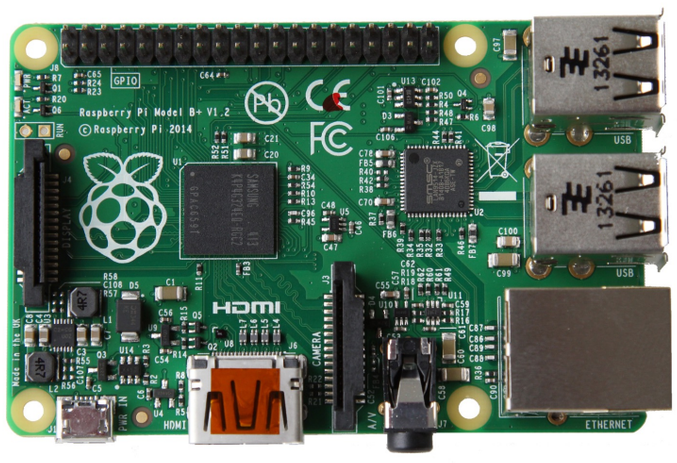

A2
A3
A4
A5
TX RX
RESET
CHG
STAT
ON
LilyPad
11
10
9
3
2

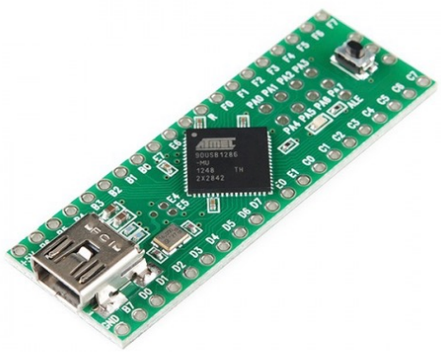

COMMUNICATION
PWM
ARDUINO
MEGA
2560

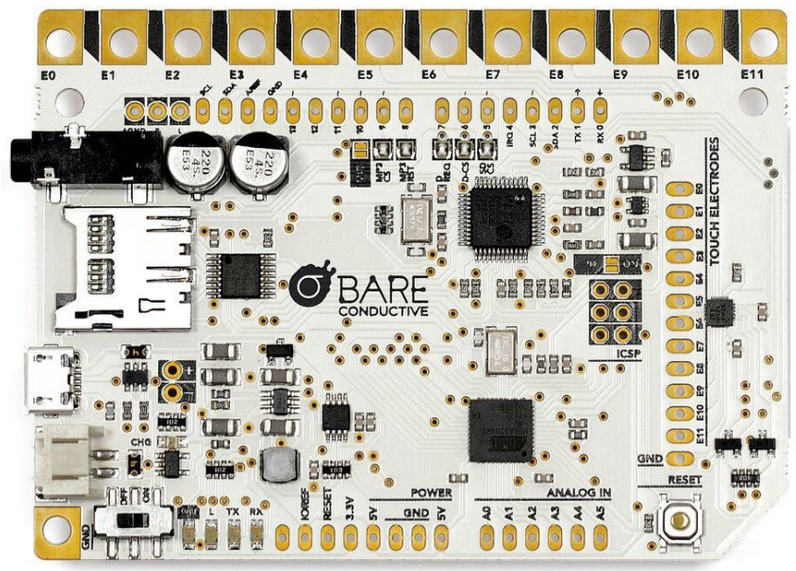



AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
SMD EDITION
UNO
ARDUINO
ON
ICSP
TX
RX
ARDUINO.ORG
MADE IN ITALY
POWER
ANALOG IN
IOREF
RESET
3.3V
5V
GND
Vin
A0
A1
A2
A3
A4
A5




Raspberry Pi Model B+ V1.2
©Raspberry Pi 2014
GPIO
HDMI
USB
USB
ETHERNET
CAMERA
DSI (DISPLAY)



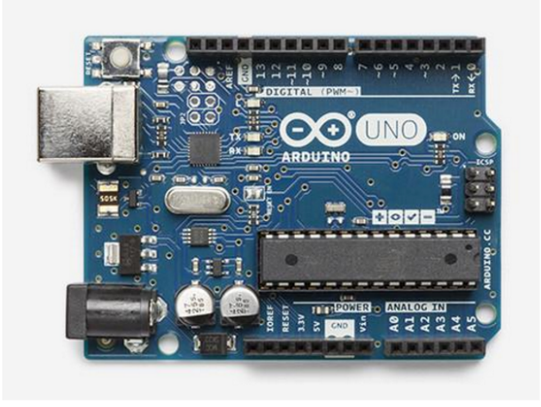

E0
E1
E2
E3
E4
E5
E6
E7
E8
E9
E10
E11
BARE
CONDUCTIVE
TOUCH ELECTRODES
ICSP
POWER
ANALOG IN
GND
RESET
3.3V
5V
A0
A1
A2
A3
A4
A5


TM
ARDUINO

https://www.youtube.com/watch?v=UoBUXOOdLXY

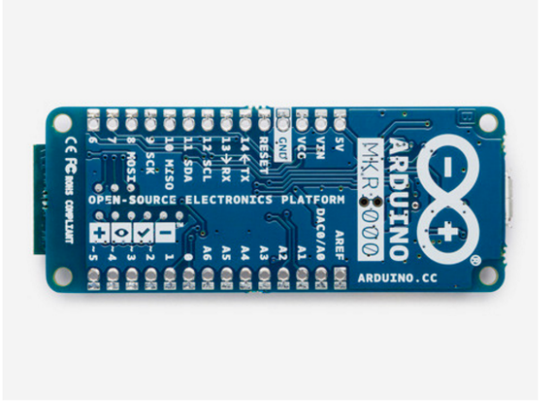
The Arduino Platform

- Inexpensive
- Cross-platform
- Simple, clear programming environment
- Open source
  - ✓ extensible software
  - ✓ extensible hardware



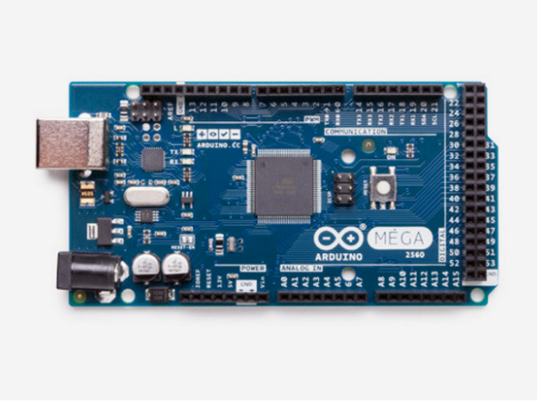
$24.95

Arduino UNO Rev3



$34.99

Arduino MKR1000



$45.95

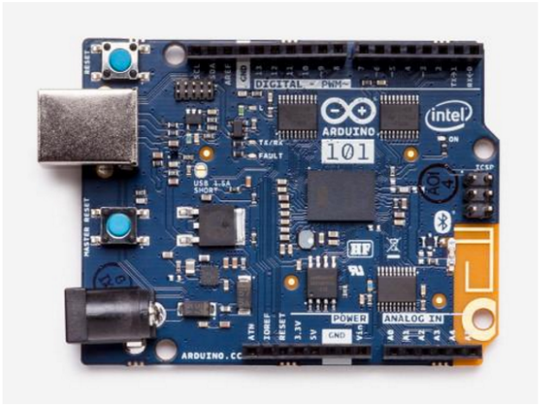
Arduino Mega 2560 Rev3

$99.90

Arduino Starter Kit

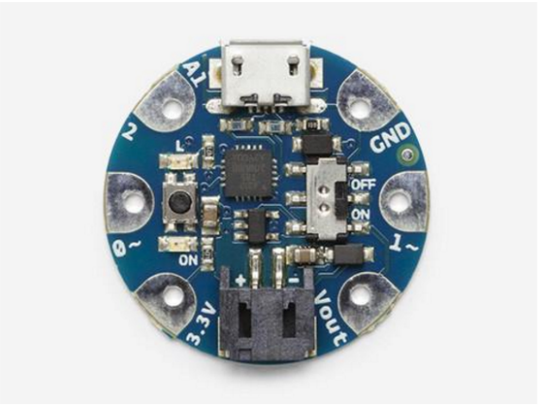
$49.90

Arduino ZERO



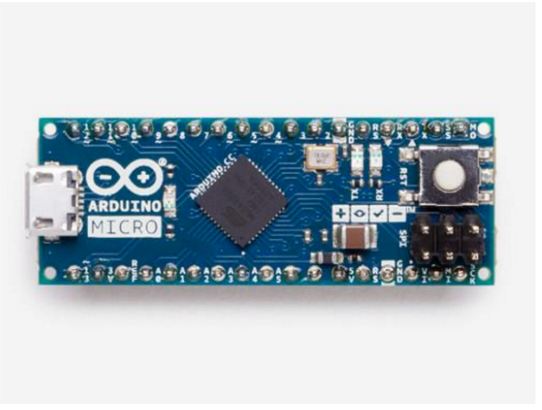
$30.00

Arduino 101



$9.95

Arduino Gemma



$24.95

Arduino Micro

lab4 | Arduino 1.6.11

lab4

```
void setup() {
  pinMode(2, INPUT);    // set the switch pin to be an input
  pinMode(3, OUTPUT);   // set the yellow LED pin to be an output
  pinMode(4, OUTPUT);   // set the red LED pin to be an output
}


void loop() {
   // read the switch input:
   if (digitalRead(2) == HIGH) {
     // if the switch is closed:
     digitalWrite(3, HIGH);    // turn on the yellow LED
     digitalWrite(4, LOW);     // turn off the red LED
   }
   else {
     // if the switch is open:
     digitalWrite(3, LOW);     // turn off the yellow LED
     digitalWrite(4, HIGH);    // turn on the red LED
   }
}
```

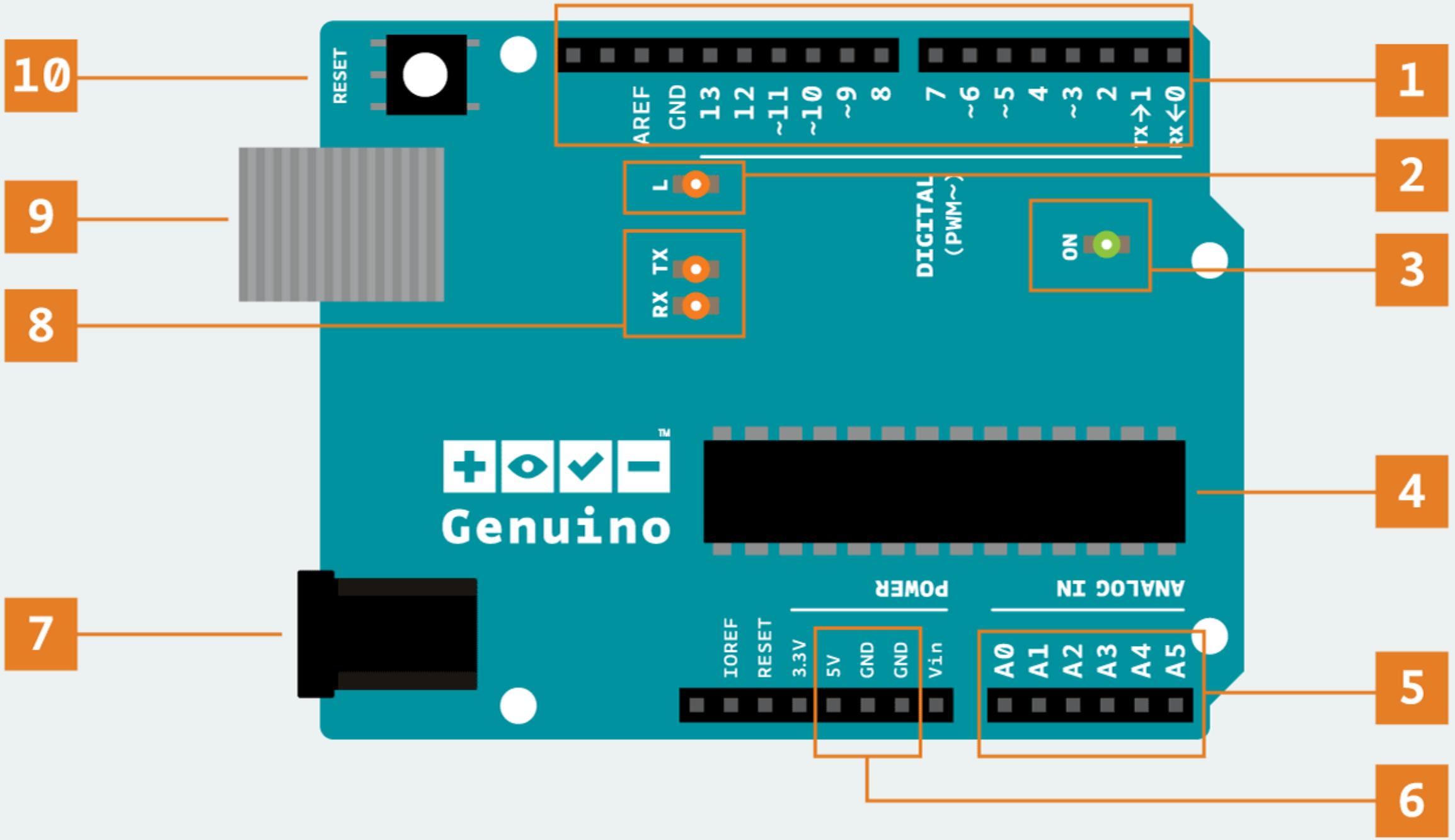
Done uploading.

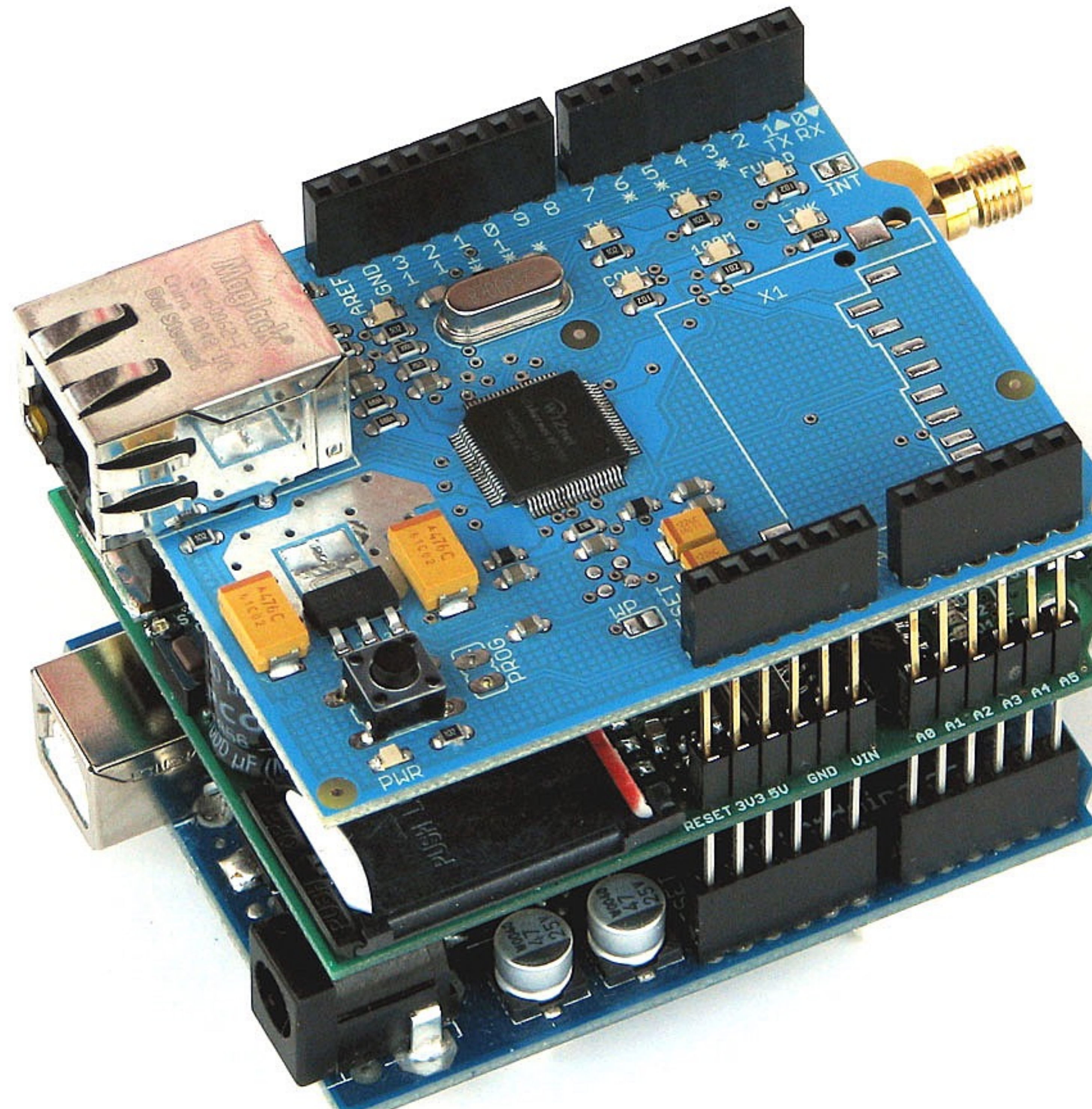
```
Sketch uses 978 bytes (3%) of program storage space. Maximum is 32,256 bytes.
Global variables use 9 bytes (0%) of dynamic memory, leaving 2,039 bytes for local variables
```

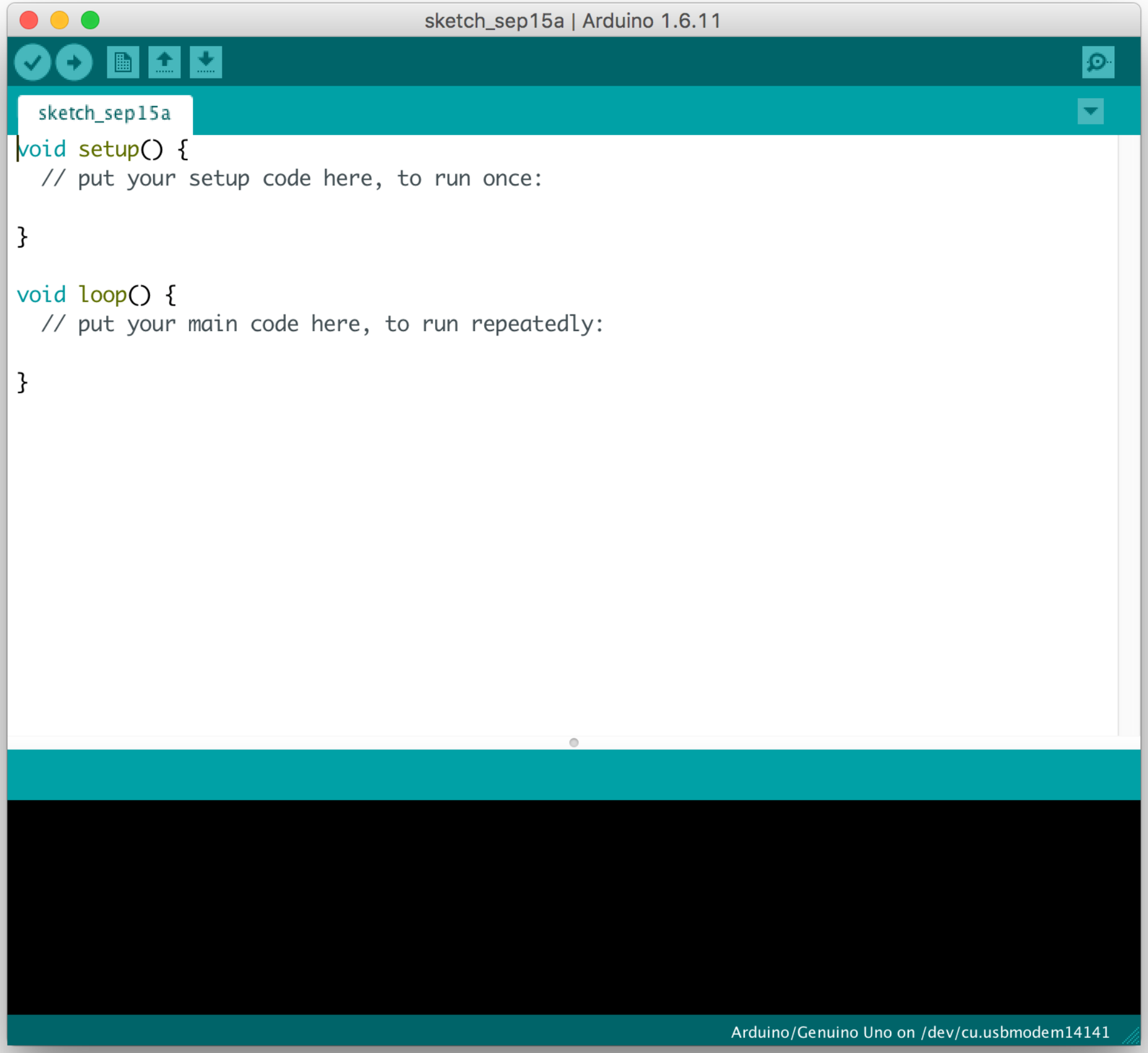
16 Arduino/Genuino Uno on /dev/cu.usbmodem14141

Features

- Digital Pins
- Analog Input Pins
- PWM
- Memory


10
9
8
7
1
2
3
4
5
6
RESET
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL
(PWM~)
L
TX
RX
ON
Genuino
POWER
ANALOG IN
IOREF
RESET
3.3V
5V
GND
GND
Vin
A0
A1
A2
A3
A4
A5


AREF
GND
TX RX
INT
X1
PROG
PWR
RESET 3V3 5V GND VIN
A0 A1 A2 A3 A4 A5


sketch_sep15a | Arduino 1.6.11
sketch_sep15a
void setup() {
// put your setup code here, to run once:
}
void loop() {
// put your main code here, to run repeatedly:
}
Arduino/Genuino Uno on /dev/cu.usbmodem14141