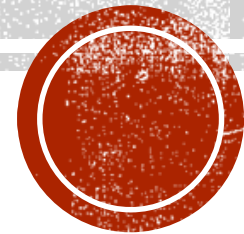


INTRODUCTION TO ARDUINO

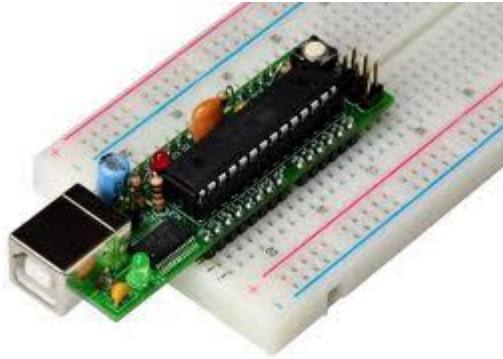


ARDUINO

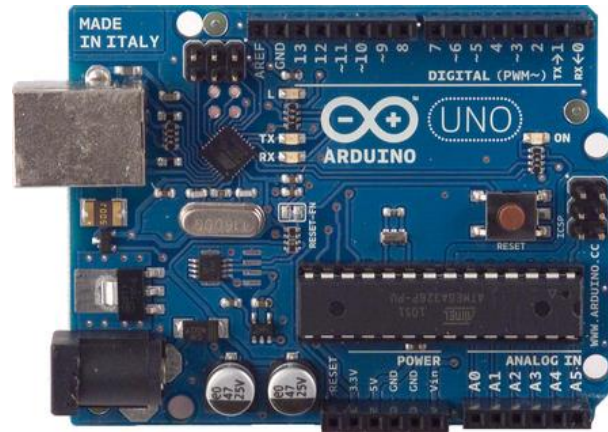
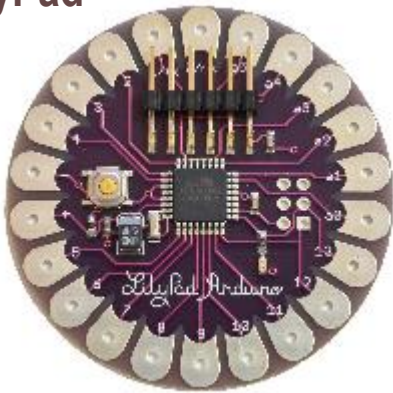
- Basically Arduino is Microcontroller.
- Microcontroller is microprocessor with memory, RAM and some other peripheral connected with it.
- The Arduino Uno is a microcontroller board based on the ATmega328 .
The ATmega328 has Flash memory of 32 KB (with 0.5 KB used for the bootloader). It also has 2 KB of SRAM and 1 KB of EEPROM

DIFFERENT TYPES OF ARDUINO

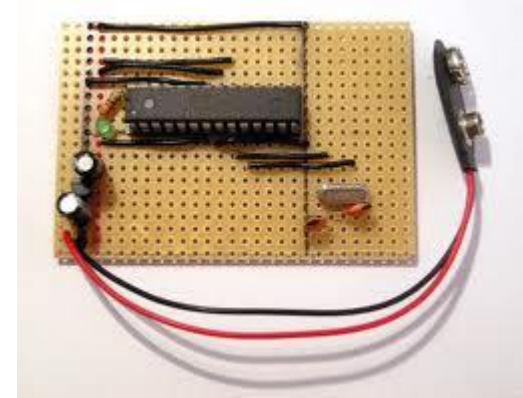
Boarduino Kit



Arduino LilyPad



Arduino Uno



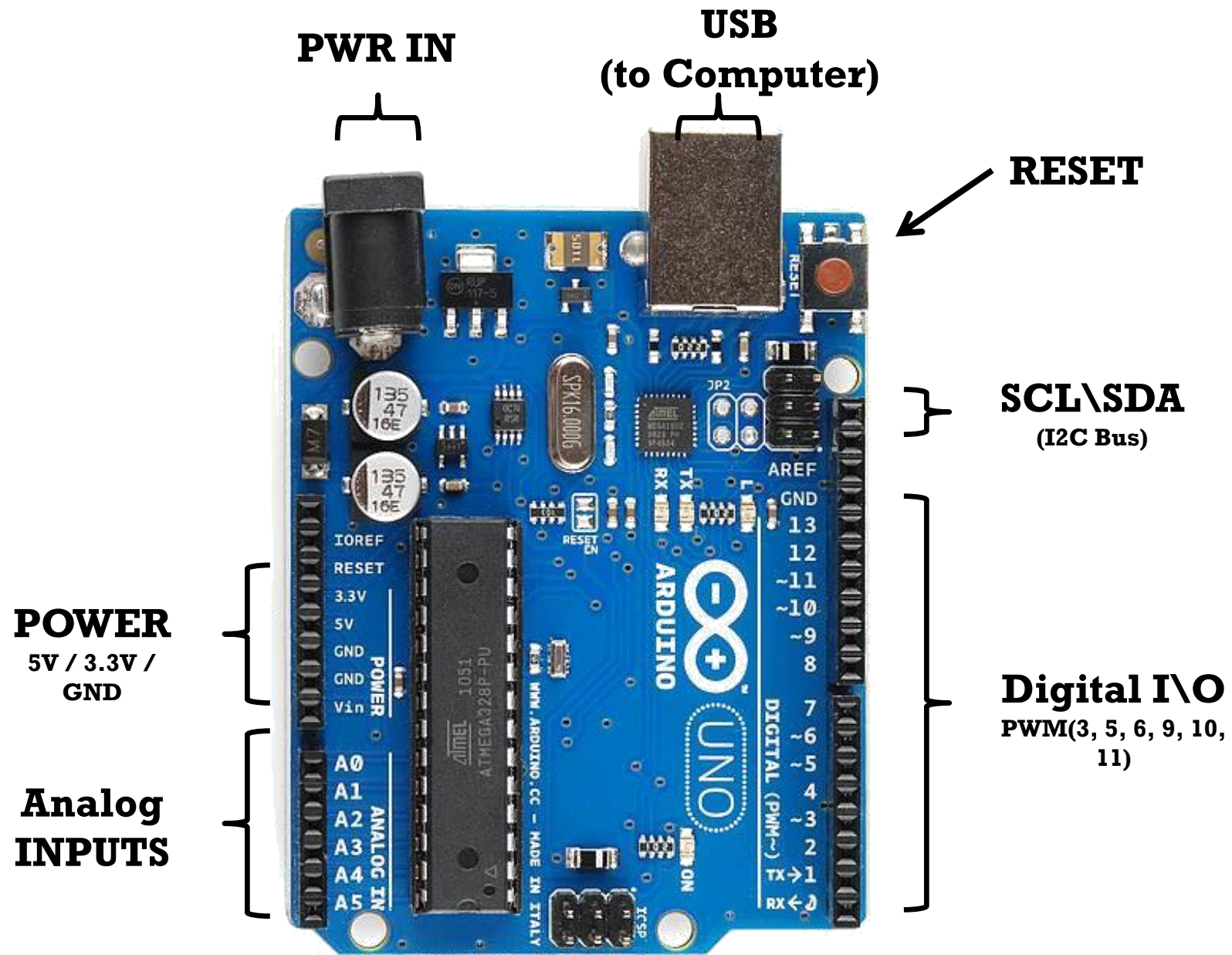
DIY Arduino

Arduino Mega 2560



ARDUINO UNO

- What does it have?
 - 14 Digital In/Out pins (6 can be used as PWM)
 - 6 Analog Inputs
 - A USB Connection
 - A Power Jack
 - Reset Button
 - On-board LED
 - SCL/SDA pins (Serial Clock/ Serial Data pins)
- In short, it contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.



HOW TO CODE IN ARDUINO

- You need to download Arduino IDE (Integrated Development Environment).
- Arduino IDE is available for all Mac, Windows, and Linux.

Download the Arduino Software



ARDUINO 1.6.4

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software.

This software can be used with any Arduino board. Refer to the [Getting Started](#) page for Installation instructions.

Windows Installer
Windows ZIP file for non admin install

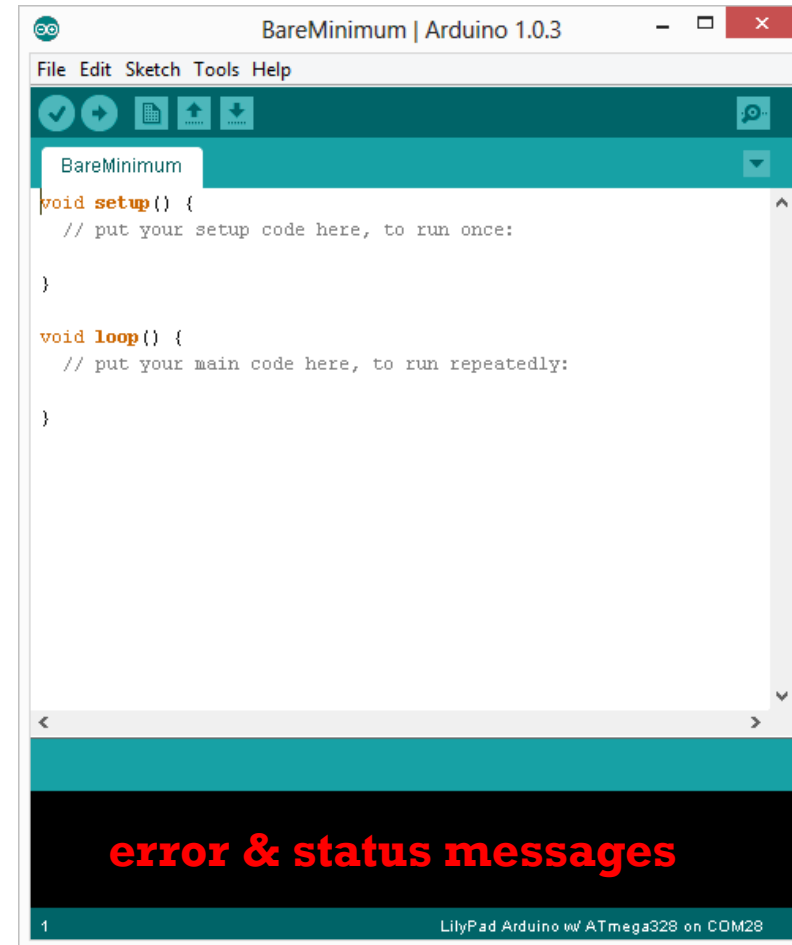
Mac OS X 10.7 Lion or newer

Linux 32 bits
Linux 64 bits

Release Notes
Source Code
Checksums

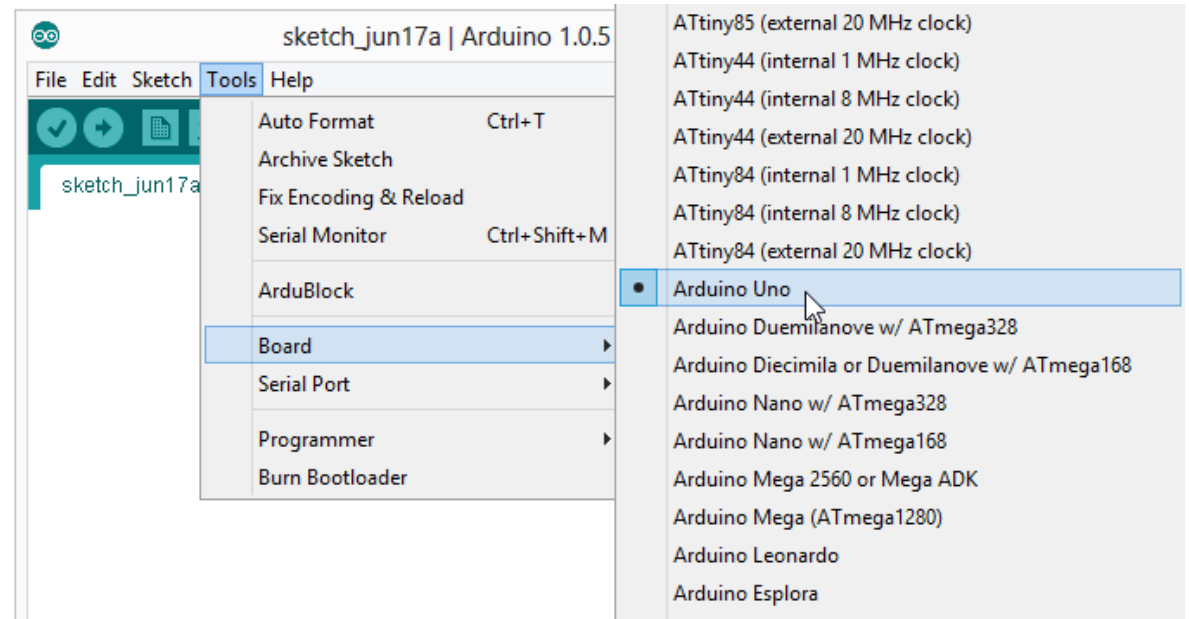
HOW TO CODE IN ARDUINO

- Once you have downloaded and installed/extracted the folder, you can directly run `Arduino.exe`, which will take you to its IDE.
- The IDE will look like the shown screenshot.



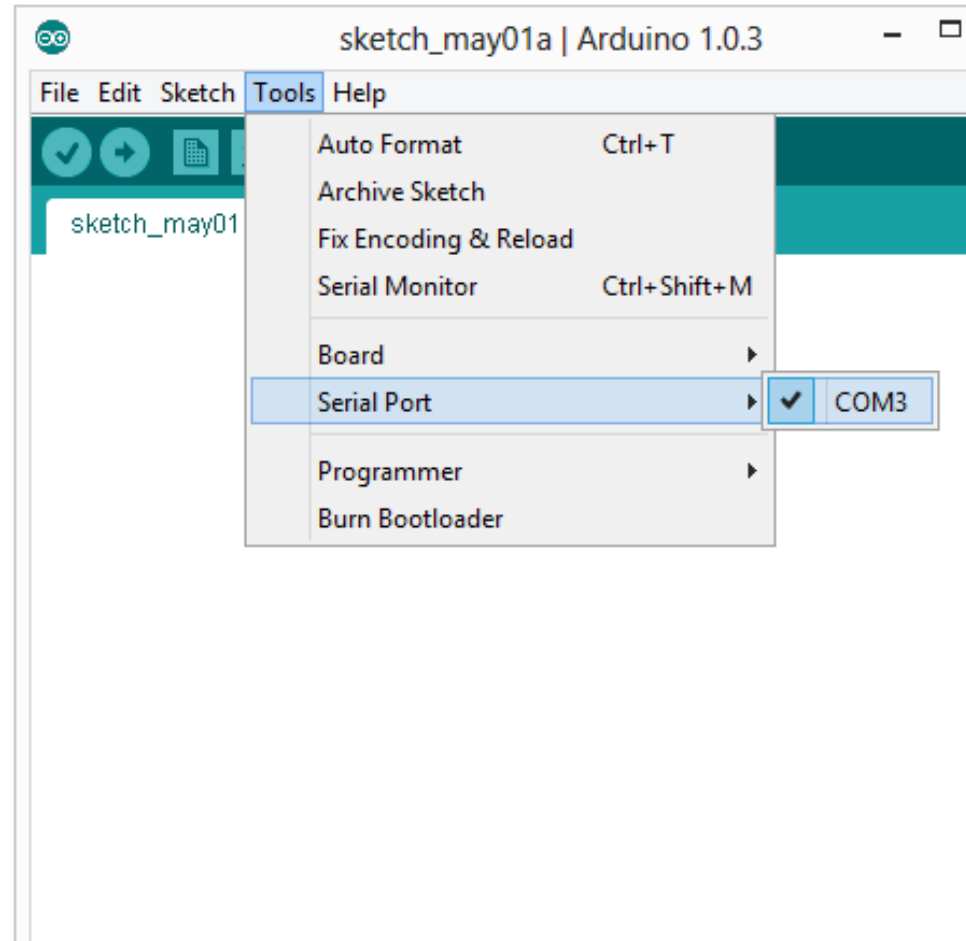
PROGRAM YOUR ARDUINO

- Before you start programming, double check that correct board is selected under Tools → Board.
- Now, you can start playing with Arduino.

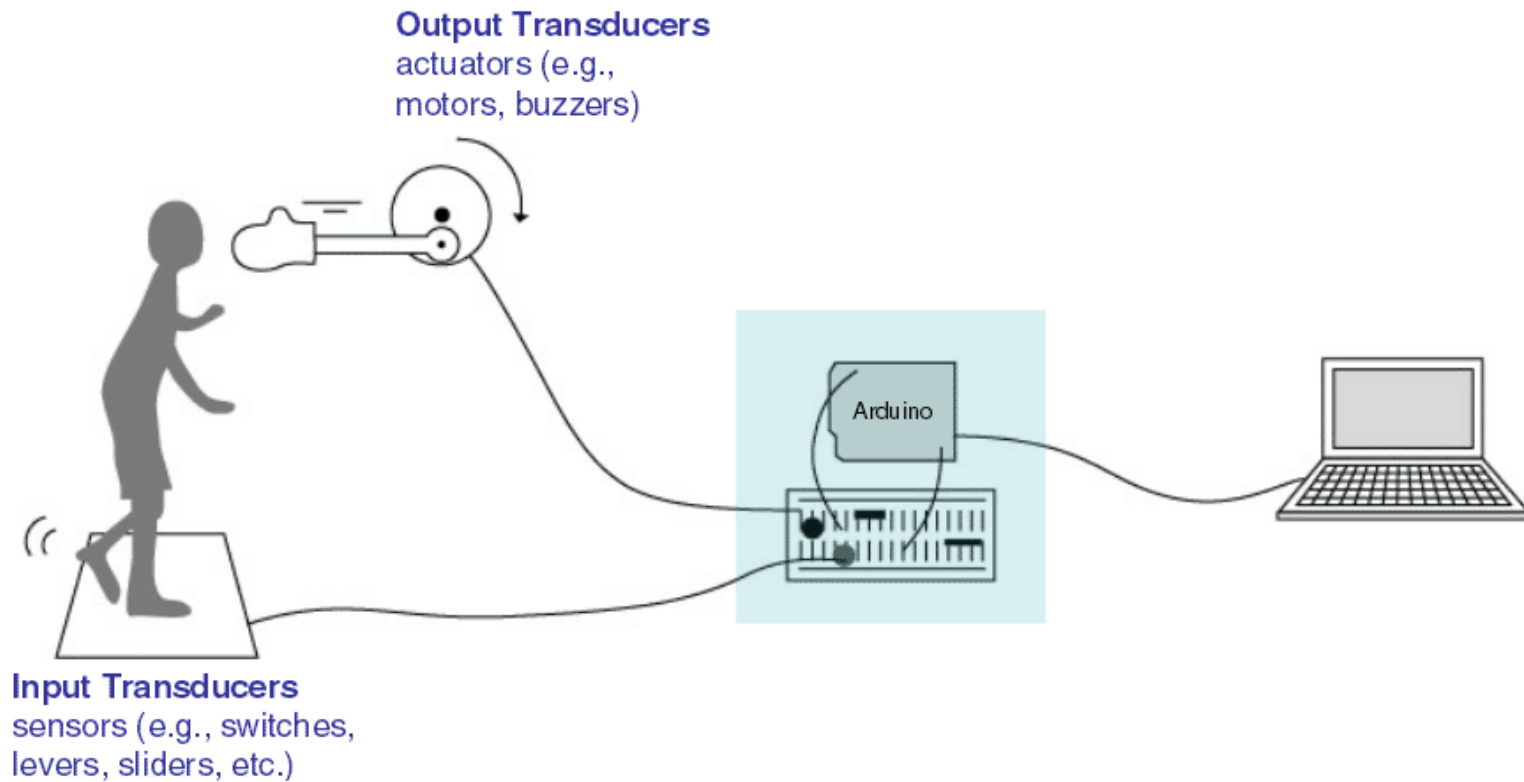


PROGRAM YOUR ARDUINO

- The Arduino Uno can be programmed with the Arduino software. Select "Arduino Uno" from the Tools > Board menu (according to the microcontroller on your board).
- All the peripheral connected with Computers are using Serial Port.
- You can check port for Arduino Uno in Device Manger.



INPUT VS OUTPUT

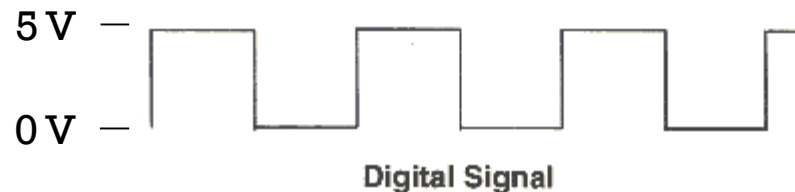


6 MAJOR CONCEPTS

- `digitalWrite()`
- `analogWrite()`
- `digitalRead()`
- If (statements) / Boolean
- `analogRead`
- Serial Communication

ANALOG VS DIGITAL

- Microcontrollers are **digital** devices – ON or OFF. Also called – discrete.
- **Analog** signals are anything that can be a full range of values.



ANALOG VS DIGITAL

▪ Analog Sensors

Sensors	Variables
Mic	soundVolume
Photoresistor	lightLevel
Potentiometer	dialPosition
Temp Sensor	temperature
Flex Sensor	bend
Accelerometer	tilt/acceleration

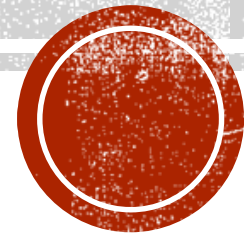
▪ Digital Sensors

- Digital sensors are more straight forward than Analog.
- No matter what the sensor there are only two settings: On and Off
- Example, Push button, Switch

SERIAL COMMUNICATION

- “Serial” because data is broken into bits, each sent one after another in a single wire.
- Compiling turns your program into binary data (ones and zeros)
- Uploading sends the bits through USB cable to the Arduino
- The two LEDs near the USB connector blink when data is transmitted.
 - RX blinks when the Arduino is receiving data.
 - TX blinks when the Arduino is transmitting data

LET'S START CODING



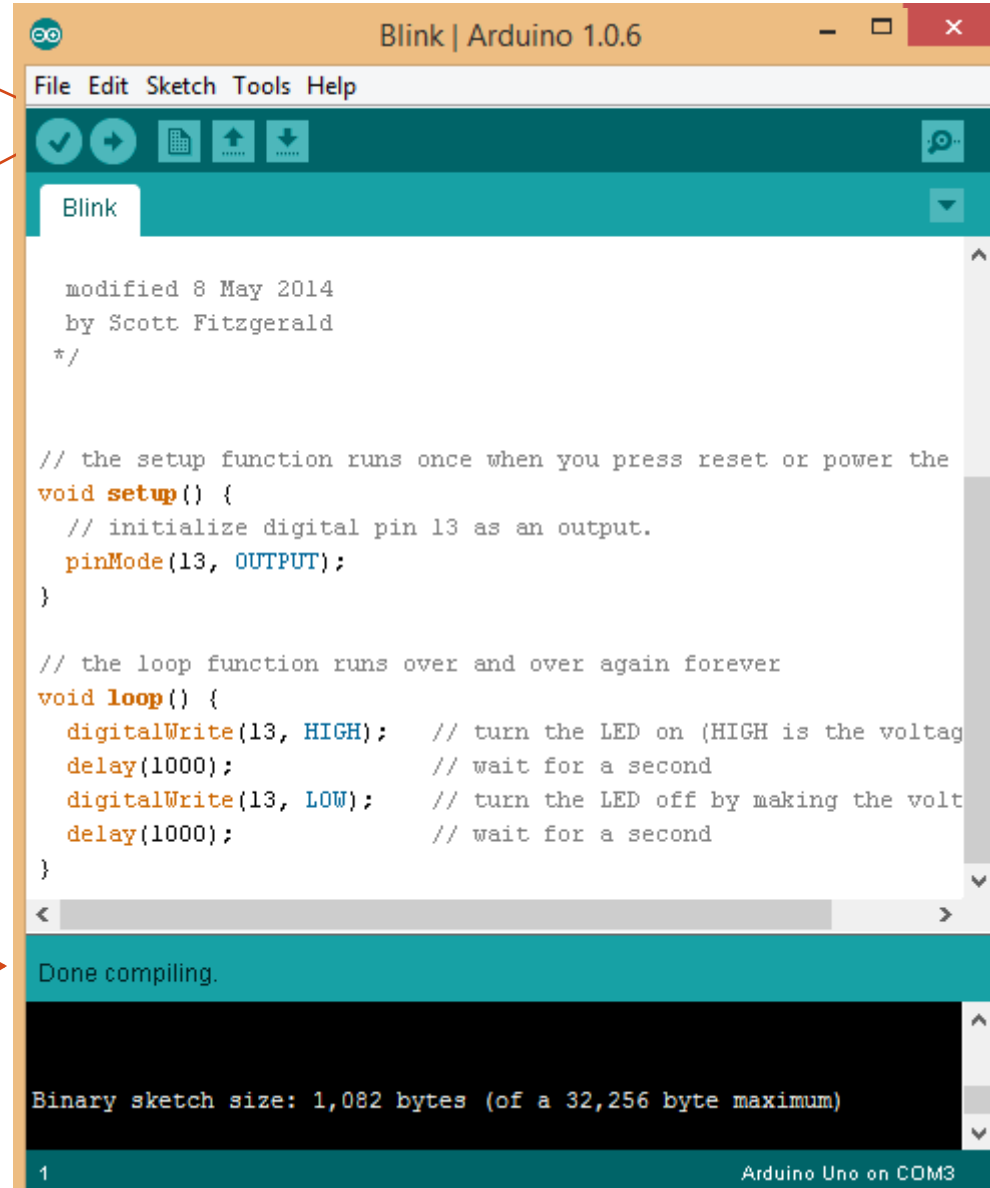
PROJECT #1 LED BLINK

- `digitalWrite()`

Upload

Compile

Status Message



THANK YOU

Lway Faisal

16th March 2024

