Lab 1: Introduction To Embedded Systems

Onur Kilincceker (MSKU, Computer Engineering)

Credits

- https://www.arduino.cc/
- https://www.simulide.com/p/home.html
- http://simonmonk.org/
- https://www.oreilly.com/library/view/electronics-cookbook/9781491953396/app02.html

Contents

1. Course syllabus and project teams
2. Lab 1: C programming
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Lab 2: Basics of Arduino Programming and Simulation (Toolchain)

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Arduino

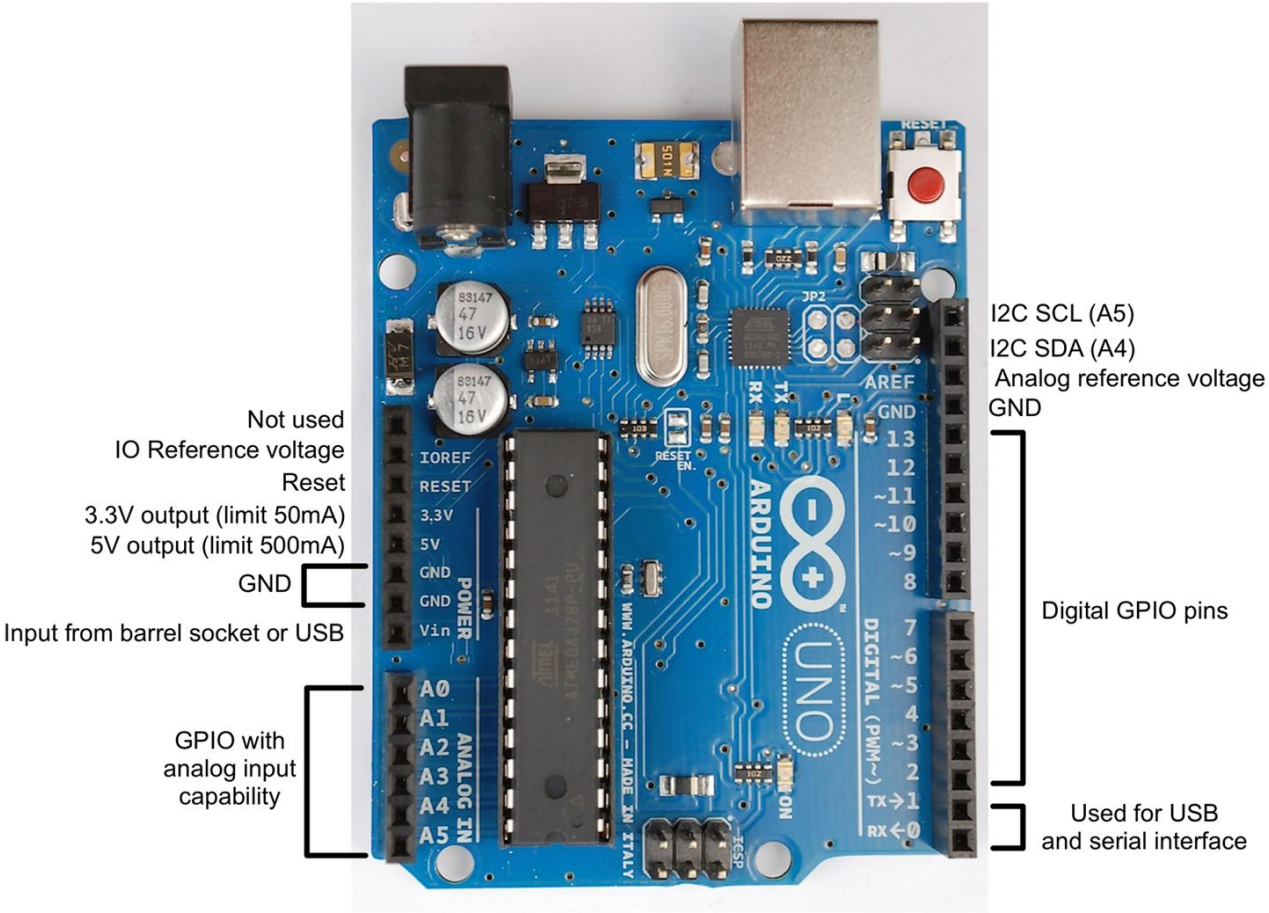
https://www.youtube.com/watch?v=UoBUXOOdLXY

How Arduino is open-sourcing imagination | Massimo Banzi

Arduino

- Arduino is an open-source electronics platform based on easy-to-use hardware and software.
- Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.
- You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

Arduino Uno Pinouts



Development

Arduino IDE

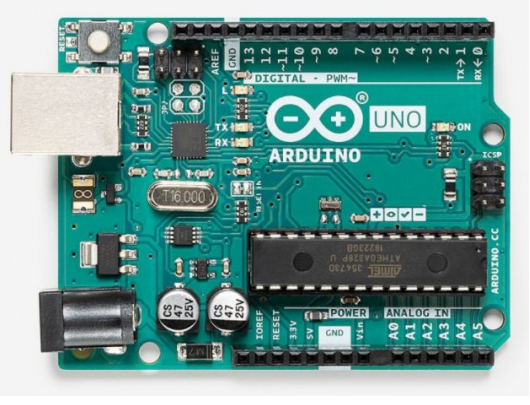
Programming

Simulation

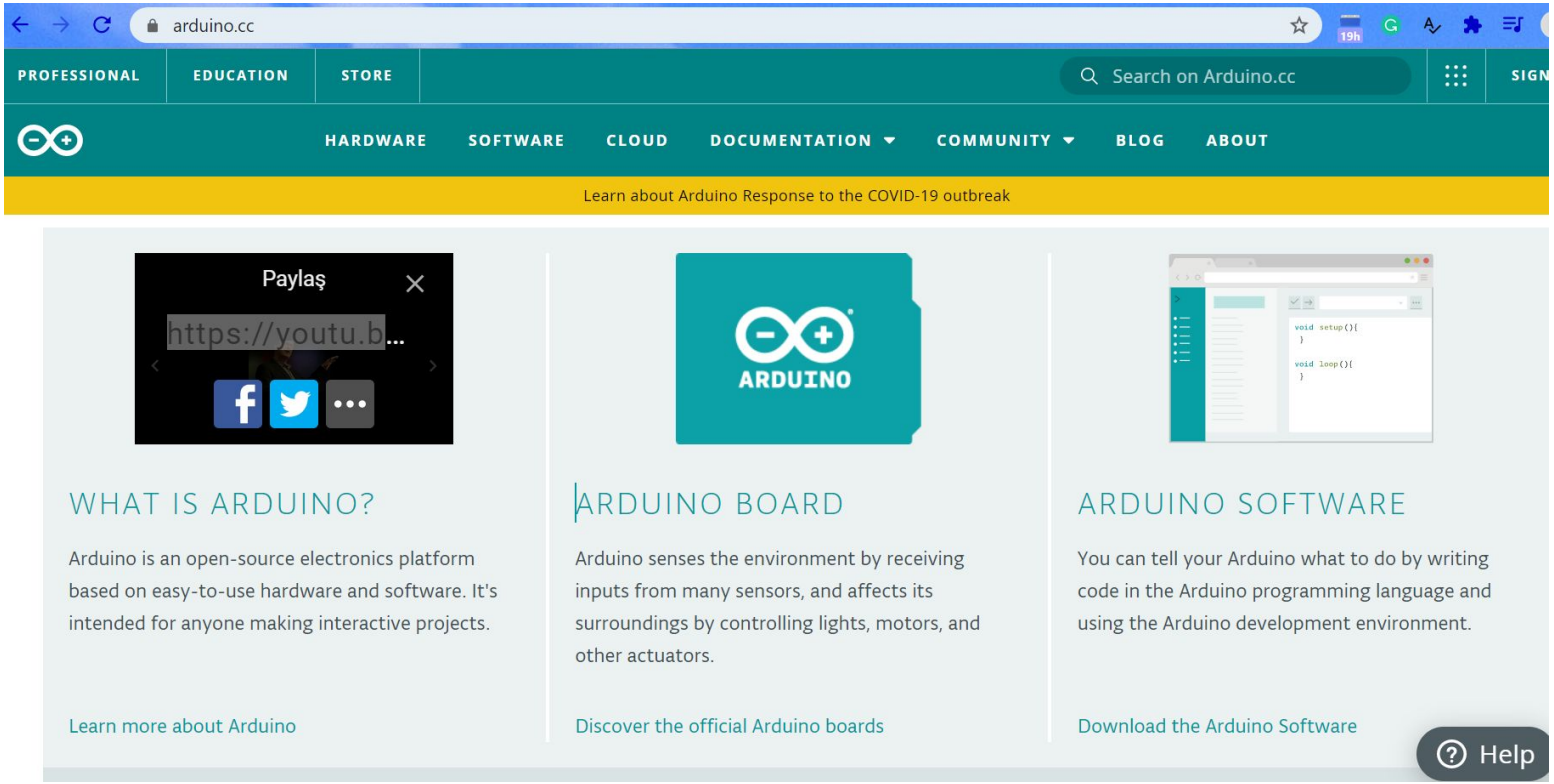
SimulIDE

Real Time Electronic Circuit Simulator. With PIC, AVR and Arduino simulation.

Production



Arduino IDE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ARDUINO
WHAT IS ARDUINO?
Arduino is an open-source electronics platform based on easy-to-use hardware and software. It's intended for anyone making interactive projects.
Learn more about Arduino
ARDUINO BOARD
Arduino senses the environment by receiving inputs from many sensors, and affects its surroundings by controlling lights, motors, and other actuators.
Discover the official Arduino boards
ARDUINO SOFTWARE
You can tell your Arduino what to do by writing code in the Arduino programming language and using the Arduino development environment.
Download the Arduino Software
Help

Arduino IDE

Downloads

Arduino IDE 1.8.13

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board.

Refer to the **Getting Started** page for Installation instructions.

SOURCE CODE

Active development of the Arduino software is **hosted by GitHub**. See the instructions for **building the code**. Latest release source code archives are available **here**. The archives are PGP-signed so they can be verified using **this** gpg key.

DOWNLOAD OPTIONS

Windows Win 7 and newer
Windows ZIP file

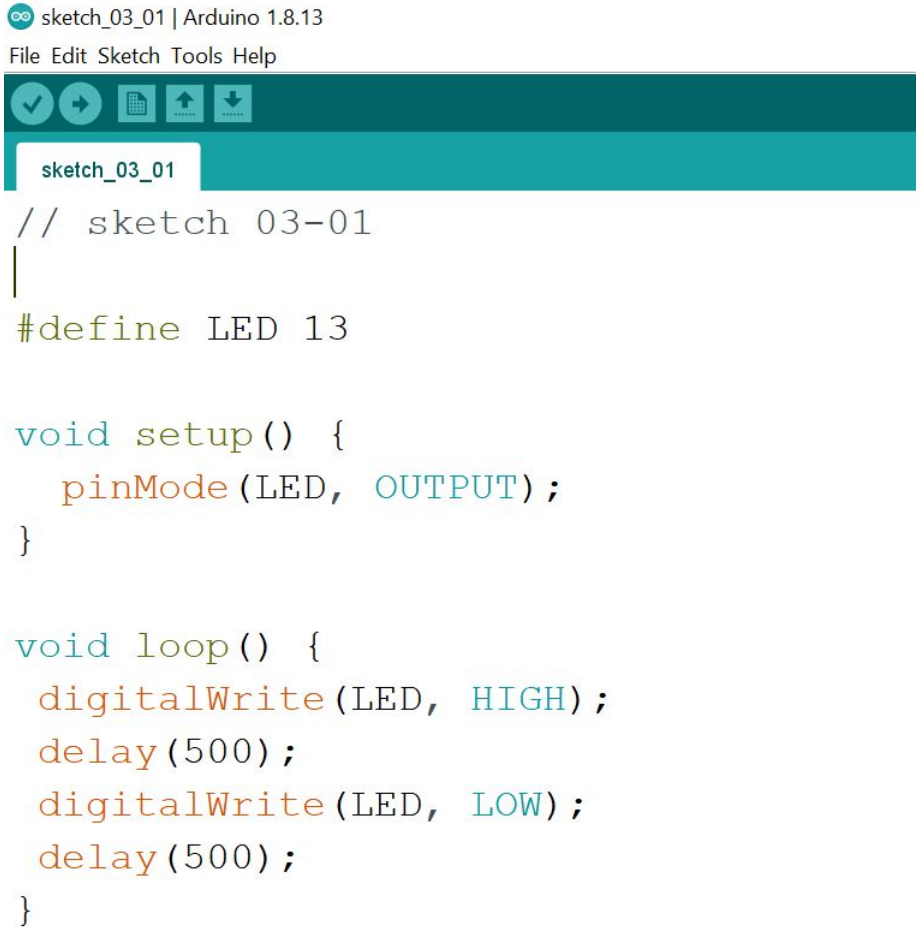
Windows app Win 8.1 or 10 Get

Linux 32 bits
Linux 64 bits
Linux ARM 32 bits
Linux ARM 64 bits

Mac OS X 10.10 or newer

Release Notes Checksums (sha512)

Arduino IDE




```
// sketch 03-01

#define LED 13

void setup() {
  pinMode(LED, OUTPUT);
}

void loop() {
 digitalWrite(LED, HIGH);
 delay(500);
 digitalWrite(LED, LOW);
 delay(500);
}
```

SIMULIDE

simulide.com/p/home.html

SimulIDE

Real Time Electronic Circuit Simulator. With PIC, AVR and Arduino simulation.

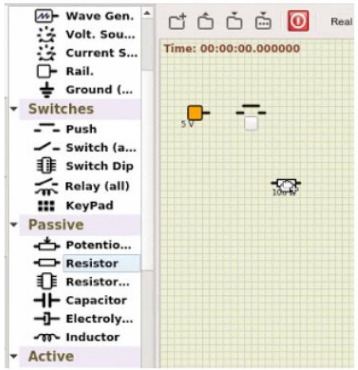
Home | Blog | Downloads | Tutorials | Forum | Utils | Contribute

SimulIDE is a simple real time electronic circuit simulator, intended for hobbyist or students to learn and experiment with simple electronic circuits and microcontrollers, supporting PIC, AVR and Arduino.

This is not an accurate simulator for circuit analysis, it aims to be fast, simple and easy to use, this means simple and not very accurate electronic models and limited features.

Simplicity and ease of use are the key features of this simulator.
You can create, simulate and interact with your circuits within minutes, just drag components from the list, drop into the circuit, connect them and push power button to see how it works.

SimulIDE also features a code Editor and Debugger for GcBasic, Arduino, PIC asm and AVR asm. It is still in it's firsts stages of development, with basic functionalities, but it is possible to write, compile and basic debugging with breakpoints, watch registers and global variables.



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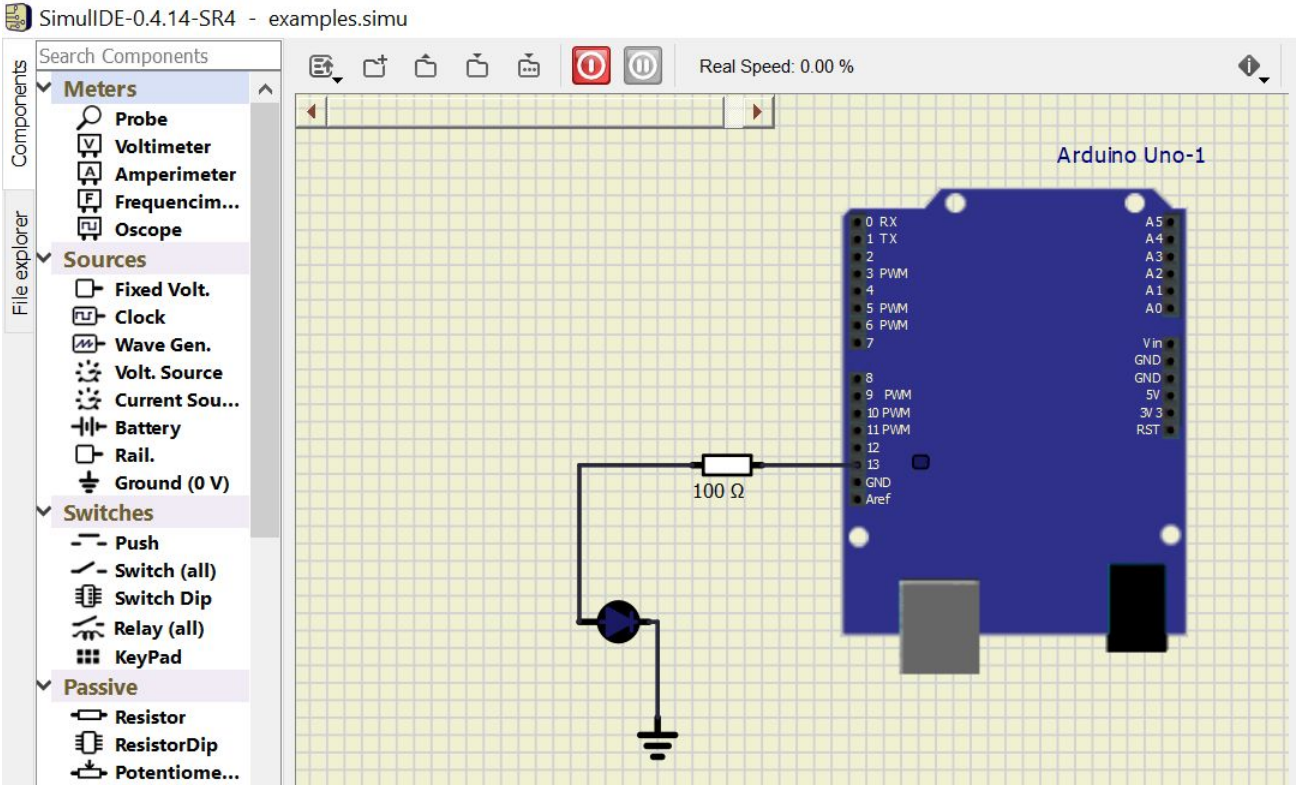
SimulIDE


SimulIDE-0.4.14-SR4 - examples.simu
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Battery
Rail.
Ground (0 V)
Switches
Push
Switch (all)
Switch Dip
Relay (all)
KeyPad
Passive
Resistor
ResistorDip
Potentiome...
Real Speed: 0.00 %
Arduino Uno-1
100 Ω