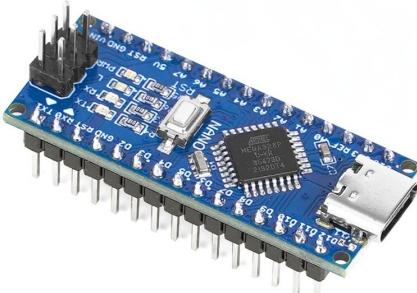


Lab 1: Introduction to Arduino



Lab goals

- Download and install Arduino IDE
- Copy and paste a basic program into Arduino IDE
- Learn to program your development board

Required hardware/software

- Arduino Nano (clone) development board
- USB cable
- Laptop running Windows 10 or Windows 11
- Arduino IDE

The screenshot shows the Arduino IDE interface. The top menu bar says "Block | Arduino IDE 2.0.0-beta.2". The main window displays the "Blink" sketch code. The code is as follows:

```
19 // This example code is in the public domain.
20 // http://www.arduino.cc/en/Tutorial/Blink
21 //
22 void setup() {
23   // initialize the LED_BUILTIN pin as an output:
24   pinMode(LED_BUILTIN, OUTPUT);
25   Serial.begin(9600);
26 }
27
28 // the loop function runs over and over again forever
29 void loop() {
30   digitalWrite(LED_BUILTIN, HIGH); // turn the LED on (HIGH is the voltage level)
31   delay(1000); // wait for a second
32   digitalWrite(LED_BUILTIN, LOW); // turn the LED off by making the voltage LOW
33   delay(1000); // wait for a second
34   Serial.println("LED is blinking");
35 }
36
37
38
39
40
```

Below the code editor is the "Serial Monitor" window. It shows the message "Message (X-Erter to send message to Arduino Nano 33 BLE on \dev\cuadmodem143201)". The output pane displays the text "LED is blinking" twice.

Lab 1: Introduction to Arduino

Steps

1. Download and install Arduino IDE (v2.3.7) from the following link:

https://downloads.arduino.cc/arduino-ide/arduino-ide_latest_Windows_64bit.exe

2. Open the newly installed Arduino IDE.

3. Verify that **Arduino AVR Boards by Arduino (v1.8.6)** is installed via Boards Manager.
(*Tools > Board ... > Board Manager*)

4. Select **Arduino Nano** board.

(*Tools > Board ... > Arduino AVR Boards > Arduino Nano*)

5. Copy and paste the code found at the following URL into the Arduino IDE's text editor window (this is the main window in the Arduino IDE):

<https://raw.githubusercontent.com/dandandrea/intro-microcontrollers-lab-001/refs/heads/main/intro-microcontrollers-lab-001.ino>

(Next slide)

Lab 1: Introduction to Arduino

Steps (continued)

6. Save the “Arduino Sketch” (program) and name it ***intro-microcontrollers-lab-001*** (File > Save)
7. Connect your development board to your laptop via the included USB cable.
8. Select the COM port for your Arduino Nano board.
(Tools > Port)
If more than one choice of port available then use Windows Device Manager to identify COM port of device named “USB-Serial CH340”
9. Program your Arduino Nano board with the program displayed in Arduino IDE.
(Sketch > Upload)
10. Verify that the LED on your Arduino Nano board is now blinking (not to be confused with the always-on power LED).
11. Change values of LED_ON_DURATION_MILLISECONDS and LED_OFF_DURATION_MILLISECONDS, program your board, and observe the effects.