Arduino

THE OPEN-SOURCE ELECTRONICS PROTOTYPING PLATFORM

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Contents

What is an Arduino ?

The Arduino is an …

- *single-board microcontroller, intended to make the application of interactive objects or environments more accessible .*
- *Designed to make the process of using electronics multidisciplinary projects more accesible*

Arduino can…

- *Sense the environment by receiving input from variety of sensors.*
- *Affect its surroundings by controlling lights, motors, and other actuators.*

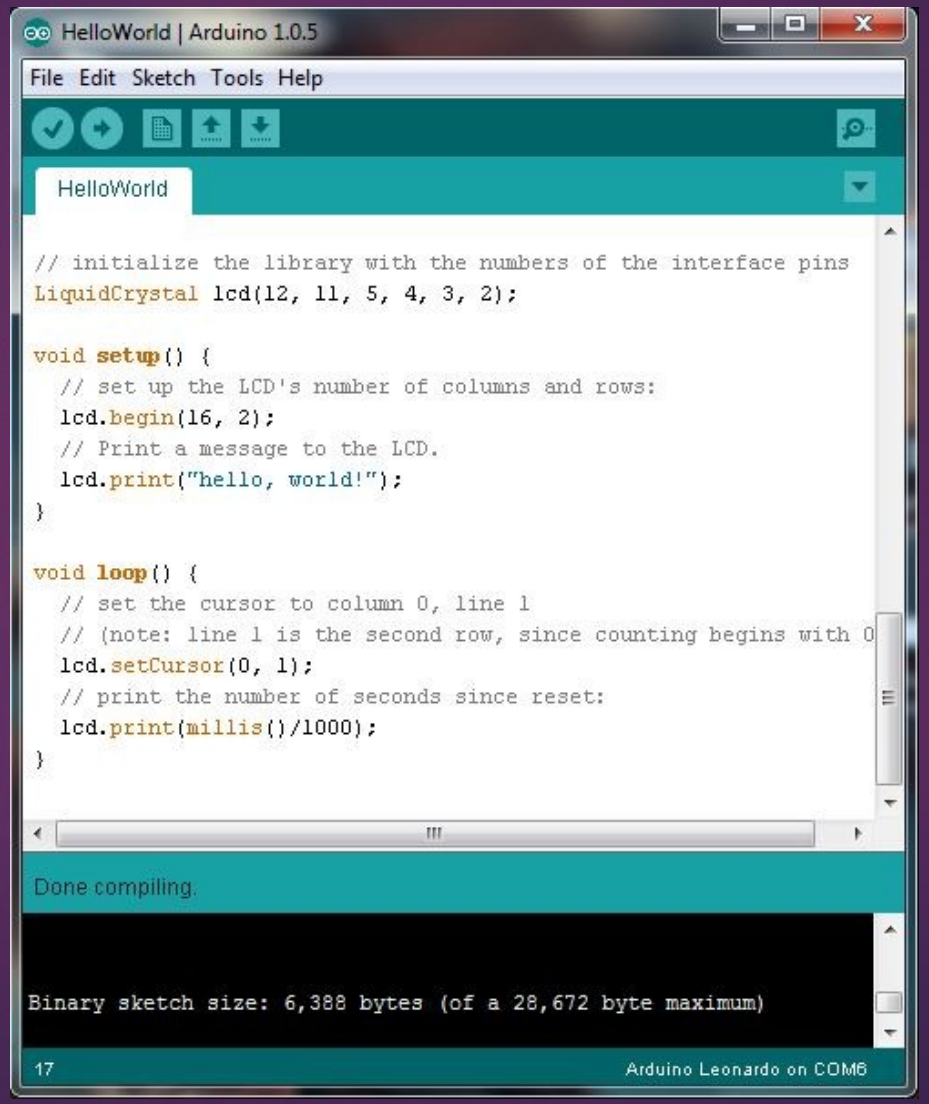
Brief History of Arduino

- *In 2005, a project was initiated to make a device for controlling student-built interactive design projects that was less expensive than other prototyping systems available at the time.*
- *Founders Massimo Banzi and David Cuartielles named the project after Arduin of Ivrea and began producing boards in a small factory located in Ivrea.*

Programming Environment

- *The Arduino Uno can be programmed with the Arduino software IDE(integrated development environment) .*
- *The Atmega328 on the Arduino Uno comes preburned with a Bootloader that allows you to upload new code to it without the use of an external hardware programmer.*
- *You can also bypass the Bootloader and program the microcontroller through the ICSP (In-Circuit Serial Programming) header.*
- *Arduino IDE works on windows , linux as well as Mac lion X platforms.*

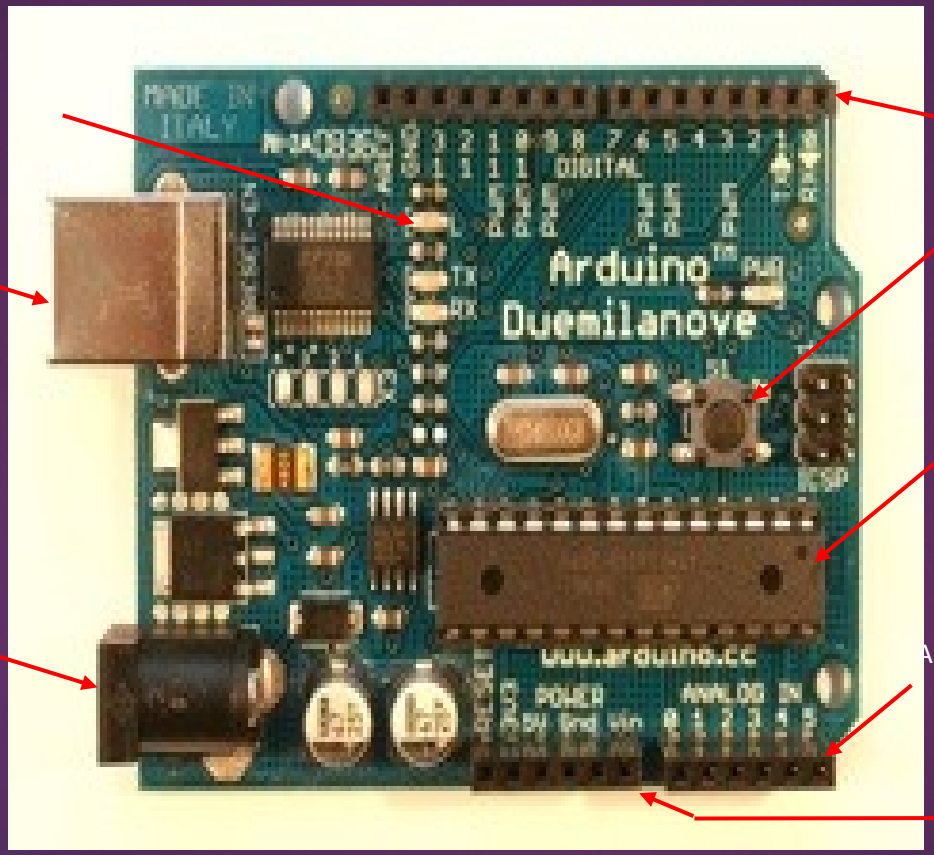
Arduino IDE


HelloWorld | Arduino 1.0.5
File Edit Sketch Tools Help
HelloWorld
// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
void setup() {
// set up the LCD's number of columns and rows:
lcd.begin(16, 2);
// Print a message to the LCD.
lcd.print("hello, world!");
}
void loop() {
// set the cursor to column 0, line 1
// (note: line 1 is the second row, since counting begins with 0
lcd.setCursor(0, 1);
// print the number of seconds since reset:
lcd.print(millis()/1000);
}
Done compiling.
Binary sketch size: 6,388 bytes (of a 28,672 byte maximum)
17
Arduino Leonardo on COM6

Advantages of Aurdino

- Open source
- Simplified and user-friendly programming language
- No additional programmer/burner hardware required for programming board
- Portable
- Low power consumption

The basic Arduino board



Arduino UNO Board

Features of Arduino UN0

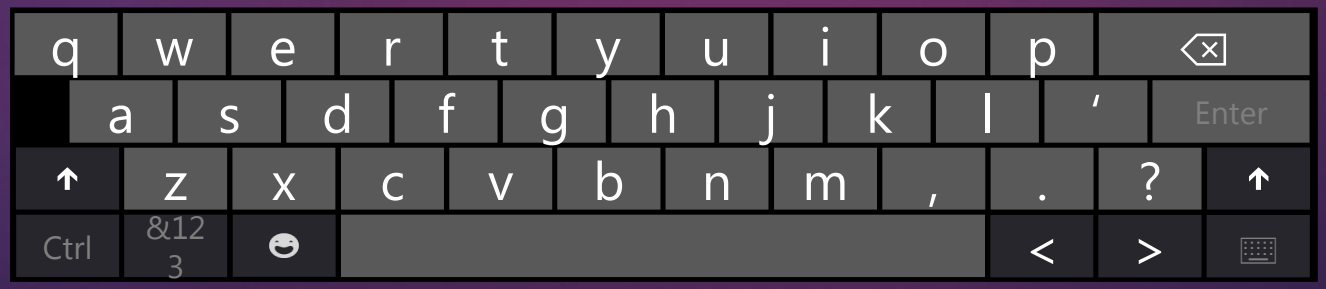
- Microcontroller ATmega328
- Operating Voltage 5V and 3.3 V
- Input Voltage (recommended) 7-12V
- Input Voltage (limits) 6-20V
- Digital I/O Pins 14 (of which 6 provide PWM output)
- Analog Input Pins 6
- DC Current per I/O Pin 40 mA
- DC Current for 3.3V Pin50 mA
- Flash Memory 32 KB (ATmega328) of which 0.5 KB used by Bootloader
- SRAM 2 KB (ATmega328)
- EEPROM 1 KB (ATmega328)
- Clock Speed 16 MHz

Most popular Arduino Boards

1. Arduino Uno
2. Arduino Leonardo
3. Arduino Mega
4. Arduino Due
5. Arduino Micro
6. Arduino LilyPad
7. Arduino Yun

Applications of Arduino

- *Home Automations*
- *Sensor prototyping*
- *Robotics*
- *ISP programming*
- *Easy Wifi ,Gsm ,Ethernet , Bluetooth , zigbee Conectivity*



Other prototyping platforms

- *Raspberry pie*
- *Beagle board*
- *Panda board*
- *Cotton candy*
- *CubieBoard*
- *APC Rock*
- *Hackberry*
- *Gooseberry*

Arduino vs other environments

- *Support for analog input*
- *Limited Computing power*
- *Comparatively cheap*
- *No GPU unit*
- *Limited memory*
- *PWM output available*
- *Open source*

Final thoughts

- *Arduino is a cheap and versatile open source prototyping environment*
- *It is basically designed for novice , non technical people*
- *Programming language is simple*
- *Arduino has a terrific community support and documentation*
- *Technical people can use Arduino for testing sensors or other prototyping work*

Where to learn Arduino ?

- http://www.arduino.cc/
- http://learn.adafruit.com/category/learn-arduino
- http://playground.arduino.cc/
- Recommended books -,Making Things Talk (by Tom Igoe), Getting Started With Arduino (by Massimo Banzi)

Thank you