

Taller sobre arduino

Universidad de Granada

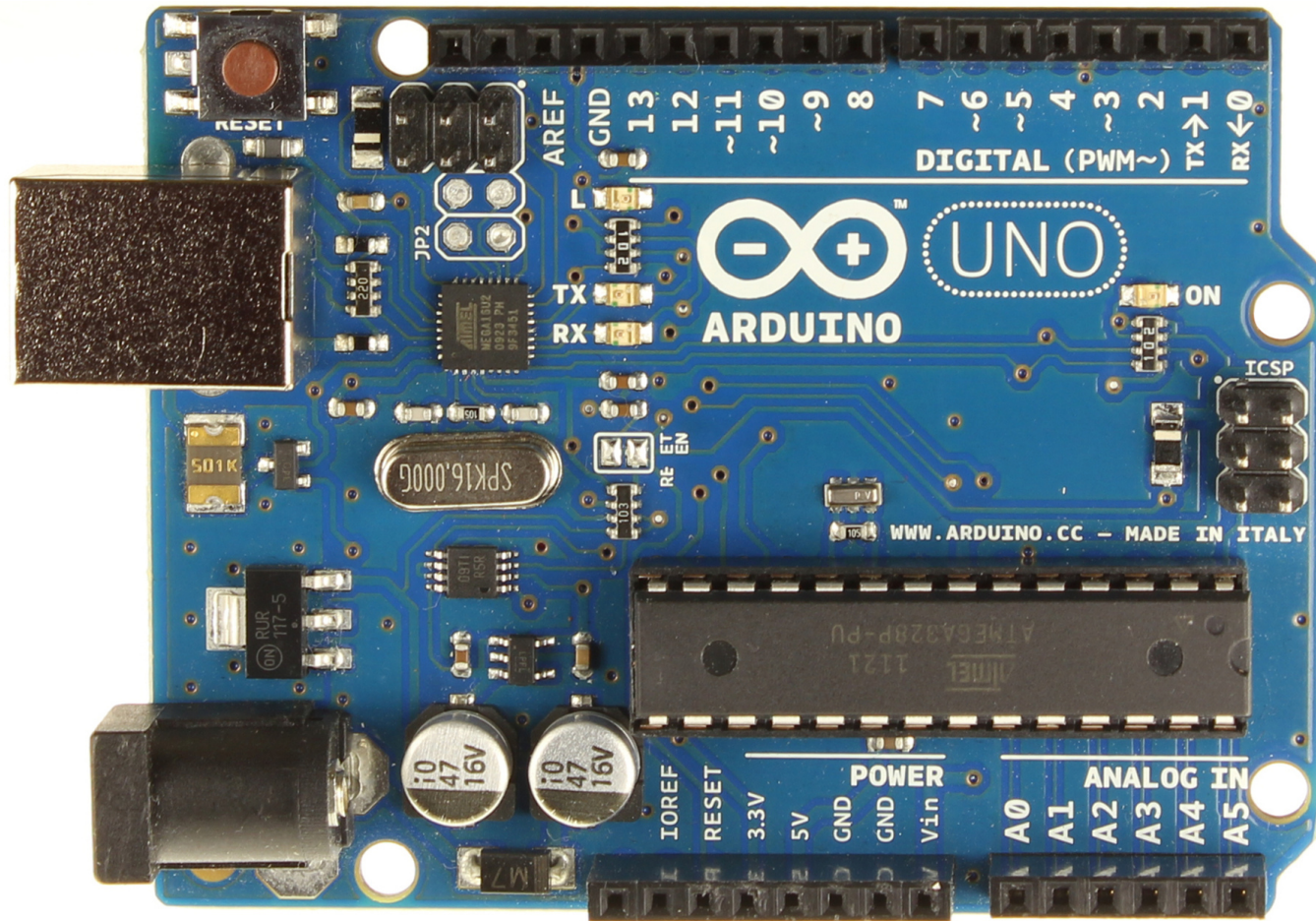
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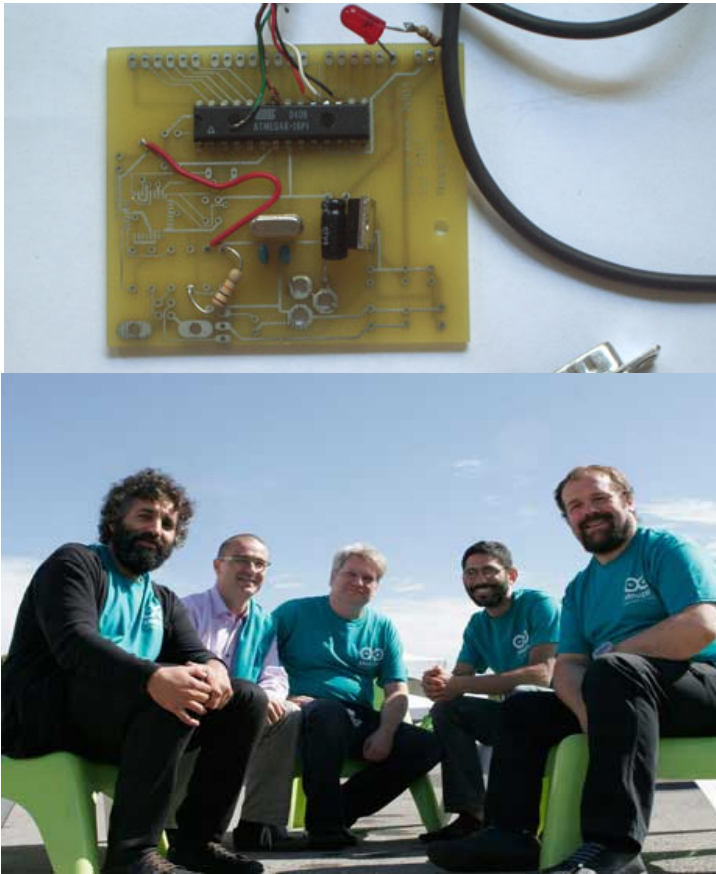
ElCacharreo.com

José Antonio Vacas

Introducción a Arduino: Presente



Introducción a Arduino: Historia

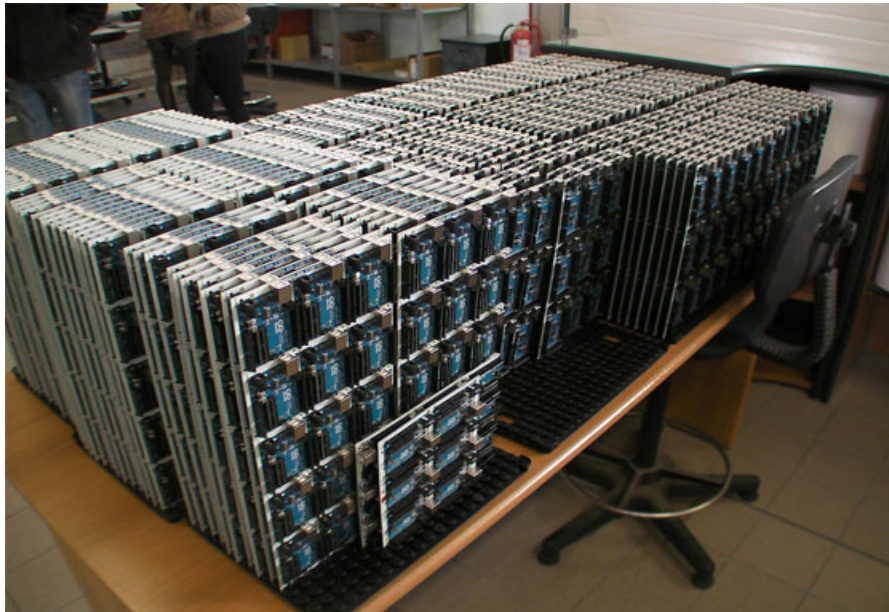


- Maximo Banzi 2005
- Un bar le da nombre
- Made in Italy
- Computación física
- Precio objetivo 30\$
- 100% free source

David Cuartielles
Gianluca Martino
Tom Igoe
David Mellis
Massimo Banzi



Introducción a Arduino: Presente



300.000 en Mayo de 2011

Uno
Ethernet
Mega
Mini
Pro
LilyPad
Bluetooth



Introducción a Arduino: Futuro

- Leonardo: usb HDI
- Due: ARM 32bits
- Wifi
- Android ADK
- ...



Introducción a Arduino: Futuro

Makers

Make:
technology on your time



Introducción a Arduino: Proyectos

Alimentador de mascotas activado por twitter



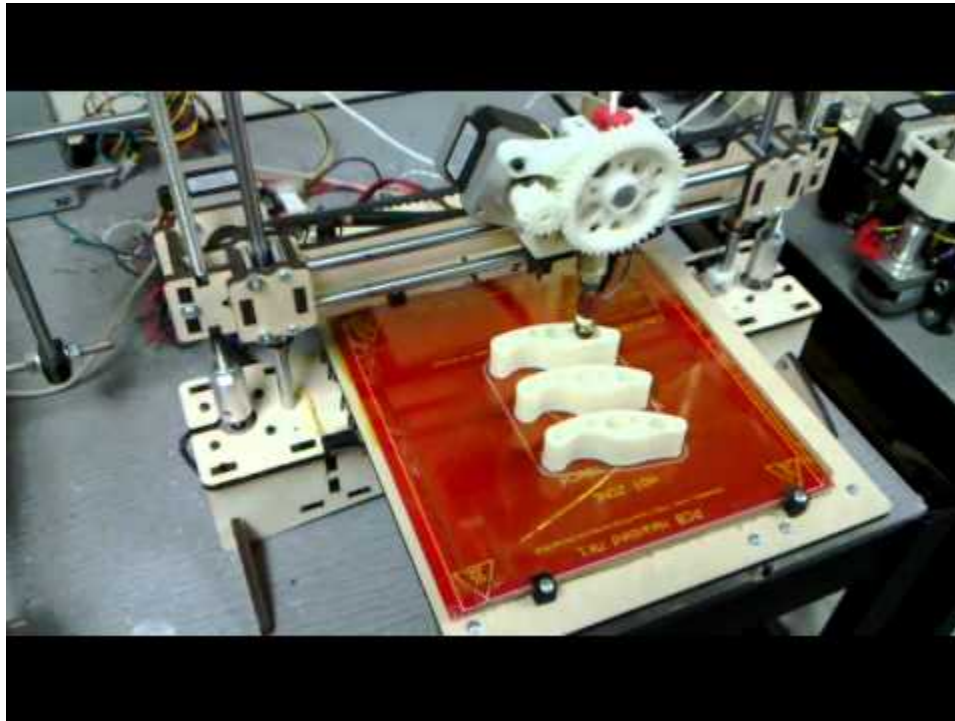
Introducción a Arduino: Proyectos

Cafetera que twitteo



Introducción a Arduino: Proyectos

Impresoras 3D: [PrintrBot](#), [RepRap](#), ...

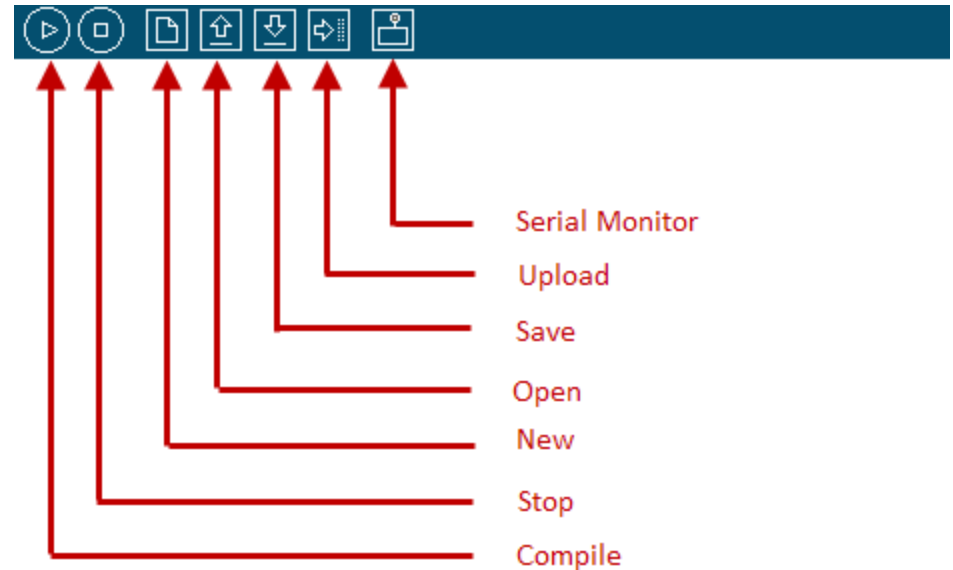
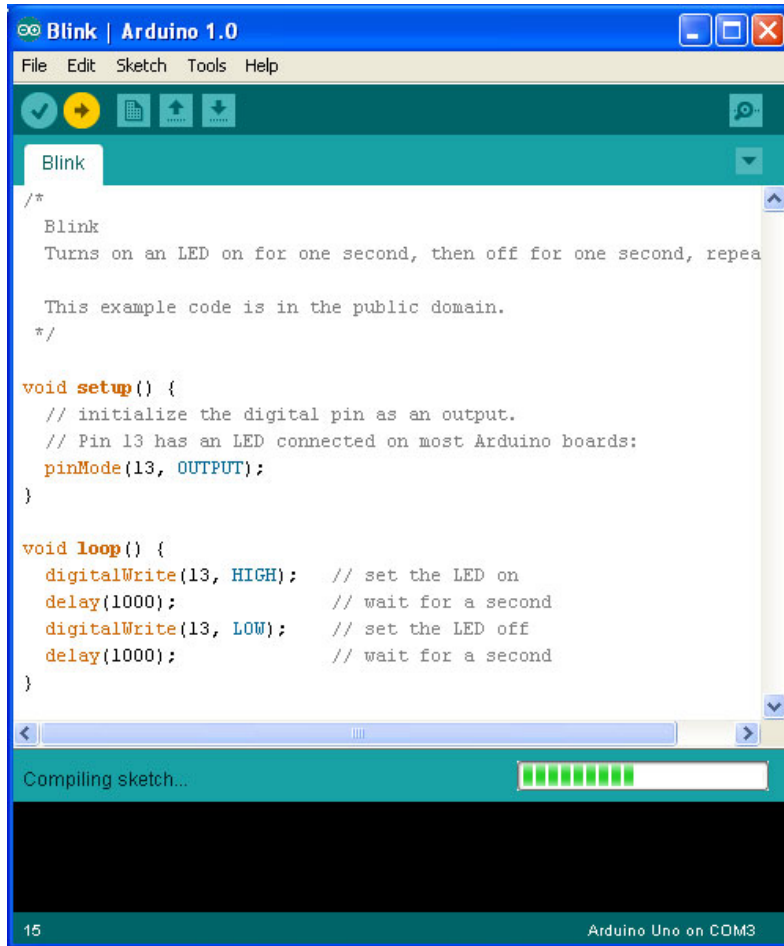


Introducción a Arduino: Proyectos

Estación de carga de coche eléctrico



Programando Arduino: IDE



Programando Arduino: Lenguaje

```
void setup()  
{}
```

```
void loop()  
{}
```

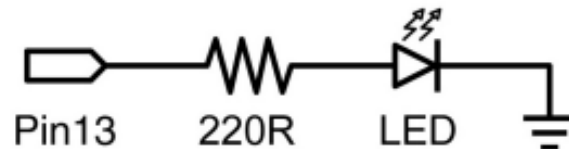
[Guía de referencia de Arduino](#)

[Librerías](#)



El mundo digital: salidas

digital output



This is the basic 'hello world' program used to simply turn something on or off. In this example, an LED is connected to pin13, and is blinked every second. The resistor may be omitted on this pin since the Arduino has one built in.

```
int ledPin = 13;           // LED on digital pin 13

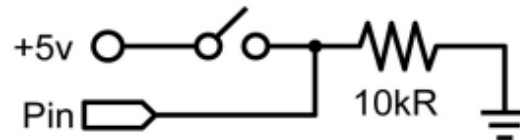
void setup()               // run once
{
  pinMode(ledPin, OUTPUT); // sets pin 13 as output
}

void loop()                // run over and over again
{
  digitalWrite(ledPin, HIGH); // turns the LED on
  delay(1000);                 // pauses for 1 second
  digitalWrite(ledPin, LOW);  // turns the LED off
  delay(1000);                 // pauses for 1 second
}
```



El mundo digital: entradas

digital input



This is the simplest form of input with only two possible states: on or off. This example reads a simple switch or pushbutton connected to pin2. When the switch is closed the input pin will read HIGH and turn on an LED.

```
int ledPin = 13;           // output pin for the LED
int inPin = 2;            // input pin (for a switch)

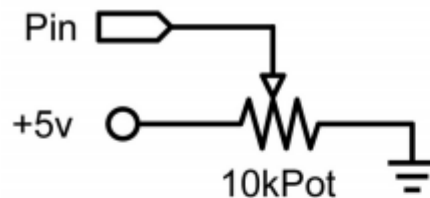
void setup()
{
  pinMode(ledPin, OUTPUT); // declare LED as output
  pinMode(inPin, INPUT);   // declare switch as input
}

void loop()
{
  if (digitalRead(inPin) == HIGH) // check if input is HIGH
  {
    digitalWrite(ledPin, HIGH); // turns the LED on
    delay(1000);                // pause for 1 second
    digitalWrite(ledPin, LOW);  // turns the LED off
    delay(1000);                // pause for 1 second
  }
}
```



El mundo analógico: entradas

potentiometer input



Using a potentiometer and one of the Arduino's analog-to-digital conversion (ADC) pins it is possible to read analog values from 0-1024. The following example uses a potentiometer to control an LED's rate of blinking.

```
int potPin = 0;    // input pin for the potentiometer
int ledPin = 13;  // output pin for the LED

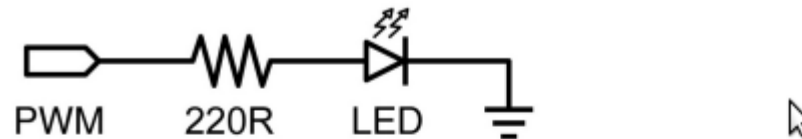
void setup()
{
  pinMode(ledPin, OUTPUT); // declare ledPin as OUTPUT
}

void loop()
{
  digitalWrite(ledPin, HIGH); // turns ledPin on
  delay(analogRead(potPin));  // pause program
  digitalWrite(ledPin, LOW);  // turns ledPin off
  delay(analogRead(potPin));  // pause program
}
```



El mundo analógico: salidas

pwm output



Pulsewidth Modulation (PWM) is a way to fake an analog output by pulsing the output. This could be used to dim and brighten an LED or later to control a servo motor. The following example slowly brightens and dims an LED using for loops.

```
int ledPin = 9;    // PWM pin for the LED

void setup(){}    // no setup needed

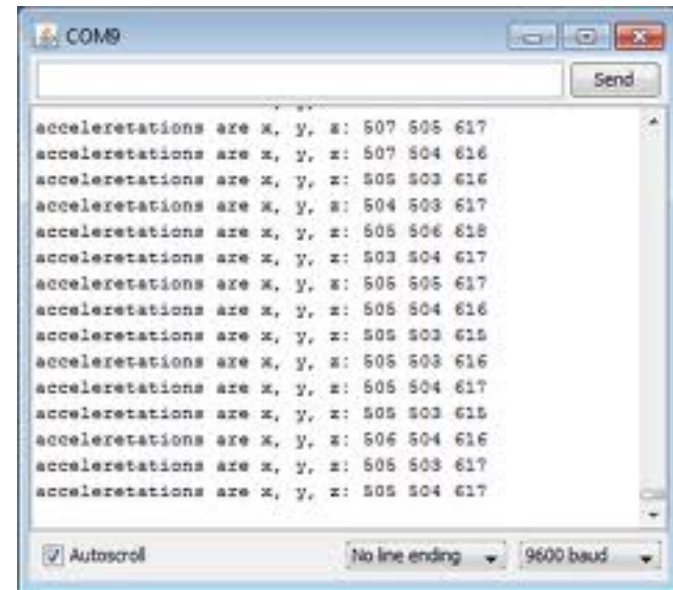
void loop()
{
  for (int i=0; i<=255; i++) // ascending value for i
  {
    analogWrite(ledPin, i); // sets brightness level to i
    delay(100);             // pauses for 100ms
  }
  for (int i=255; i>=0; i--) // descending value for i
  {
    analogWrite(ledPin, i); // sets brightness level to i
    delay(100);             // pauses for 100ms
  }
}
```



Comunicaciones: introducción

Comunicando con el pc:

```
void setup() {  
  Serial.begin(9600);  
  
  int i=0;  
  void loop() {  
    Serial.print("hola ");  
    Serial.println(i);  
  }  
}
```



Comunicaciones: el puerto serie

Comandos via serie

Functions

- begin()
- end()
- available()
- read()
- peek()
- flush()
- print()
- println()
- write()
- SerialEvent()



Comunicaciones: SPI, I2C, OneWire

Ejemplo I2C

Ejemplo OneWire del ide

Ejemplos



Información interna

Podemos obtener información sobre el micro.

Bajamos de nivel

[Ejemplo](#)



Fuentes

arduino
arduino programming notebook
freedduino



Conclusiones

Gracias por vuestra atención

