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# Arduino development with Ruby

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# What is Arduino

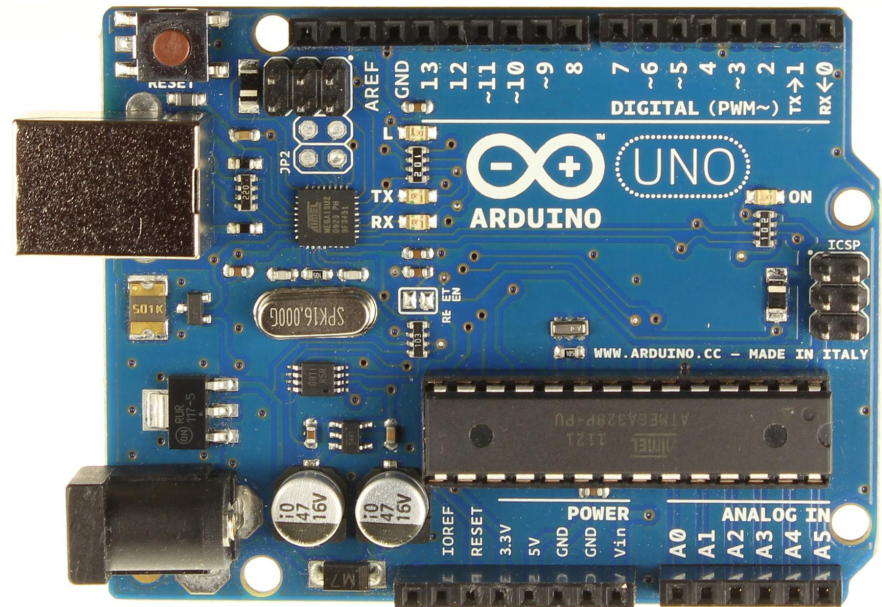
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- Hardware
  - Software
  - Fun
-

# Arduino Hardware

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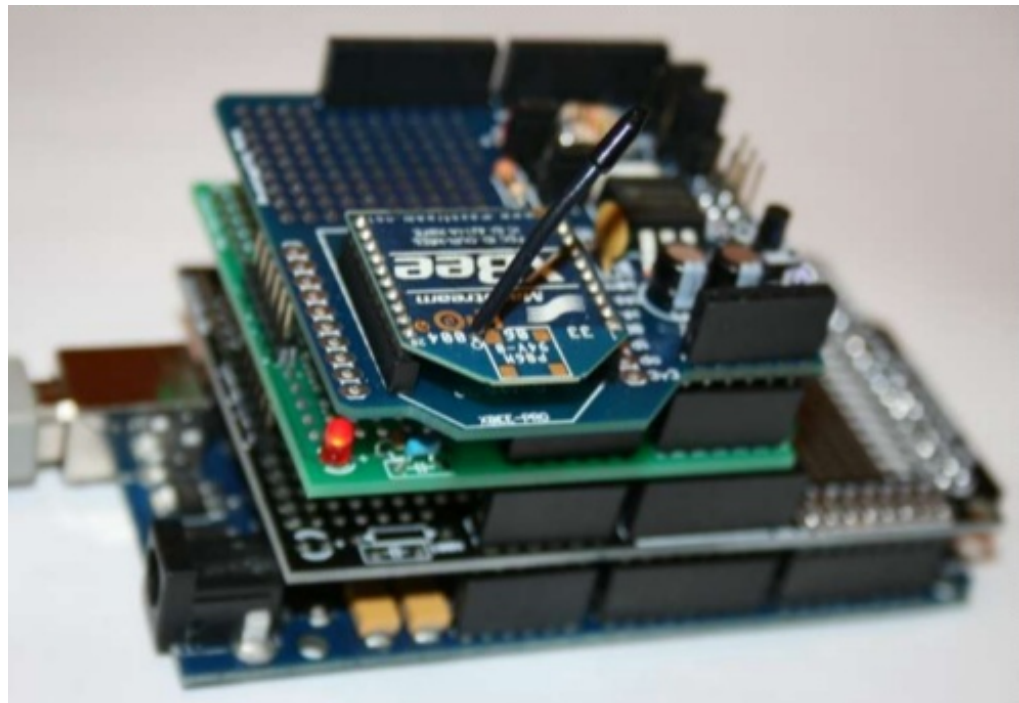
- 8-16 Mhz processor
- 14 digital I/O pins
- 6 analog inputs
- 6 PWM outputs
- 32k flash
- 2k RAM
- Shields



# Arduino Shields

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- Ethernet Shield
- Wi-Fi Shield
- GSM Shield
- Motor Shield
- Digit Shield
- NFC Shield
- And many more...



# Arduino Software

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- Arduino IDE
  - C like language
-

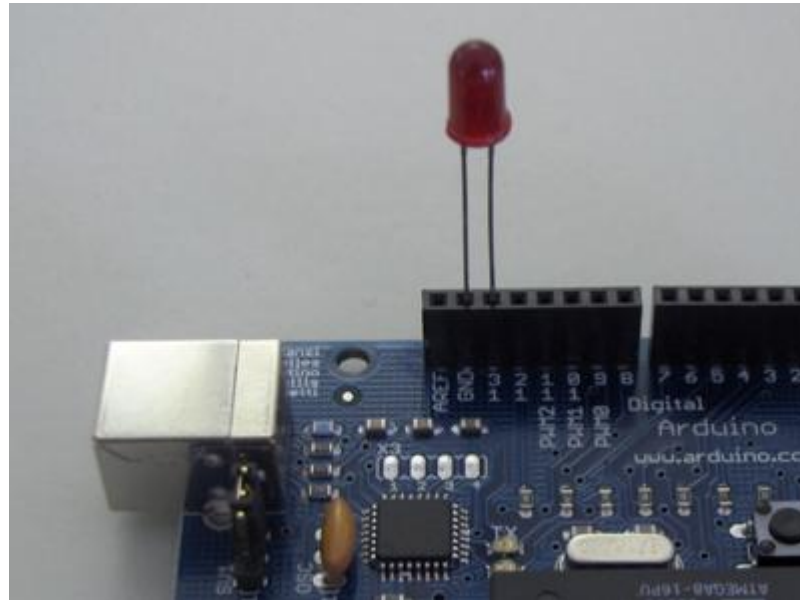
# Arduino Hello World

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```
int ledPin = 13;           // LED connected to digital pin 13

void setup()
{
  pinMode(ledPin, OUTPUT); // sets the digital pin as output
}

void loop()
{
  digitalWrite(ledPin, HIGH); // sets the LED on
  delay(1000);                // waits for a second
  digitalWrite(ledPin, LOW);  // sets the LED off
  delay(1000);                // waits for a second
}
```



# Arduino and Ruby

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1. RAD
  2. SerialPort
  3. Firmata
  4. Dino
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# RAD

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- Compiles to C
  - Outdated
  - Unmaintained
  - Ruby 1.8.7
  - Does not play well with Linux
-



# RAD

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```
class MyProject < ArduinoSketch
  output_pin 13, :as => led
  def loop
    blink led, 500
  end
end
```

```
$ rake make:upload
```

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# SerialPort

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- Not designed for arduino
  - Direct access
  - Required USB cable connection
-

# SerialPort

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```
require 'serialport'
```

```
sp = SerialPort.new('/dev/tty.usb-device', 9600, 8, 1, 0)
```

```
loop do
```

```
  line = sp.gets
```

```
  if line
```

```
    puts "New volume: #{line}"
```

```
    `ocascript -e "set volume #{line}"`
```

```
  end
```

```
end
```

```
sp.close
```



# Firmata

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- Designed by arduino
  - Access to all components
  - Low level
  - Requires USB cable connection
-

# Firmata

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```
arduino = ArduinoFirmata.connect
```

```
pin_num = 11
```

```
loop do
```

```
  0.upto(255) do |i|
```

```
    arduino.analog_write pin_num, i
```

```
    sleep 0.01
```

```
  end
```

```
  255.downto(0) do |i|
```

```
    arduino.analog_write pin_num, i
```

```
    sleep 0.01
```

```
  end
```

```
end
```

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# Dino

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- Most ruby like
  - Good for prototyping
  - Well maintained, documented
  - Requires USB cable connection
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# Dino

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```
board = Dino::Board.new(Dino::TxRx.new)
led = Dino::Components::Led.new(pin: 13, board: board)
```

```
[:on, :off].cycle do |switch|
  led.send(switch)
  sleep 0.5
end
```

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# Fun - Github stoplight

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[http://urbanhonking.com/ideasfordozens/2010/05/19/the\\_github\\_stopligh/](http://urbanhonking.com/ideasfordozens/2010/05/19/the_github_stopligh/)

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# Fun - Led coat

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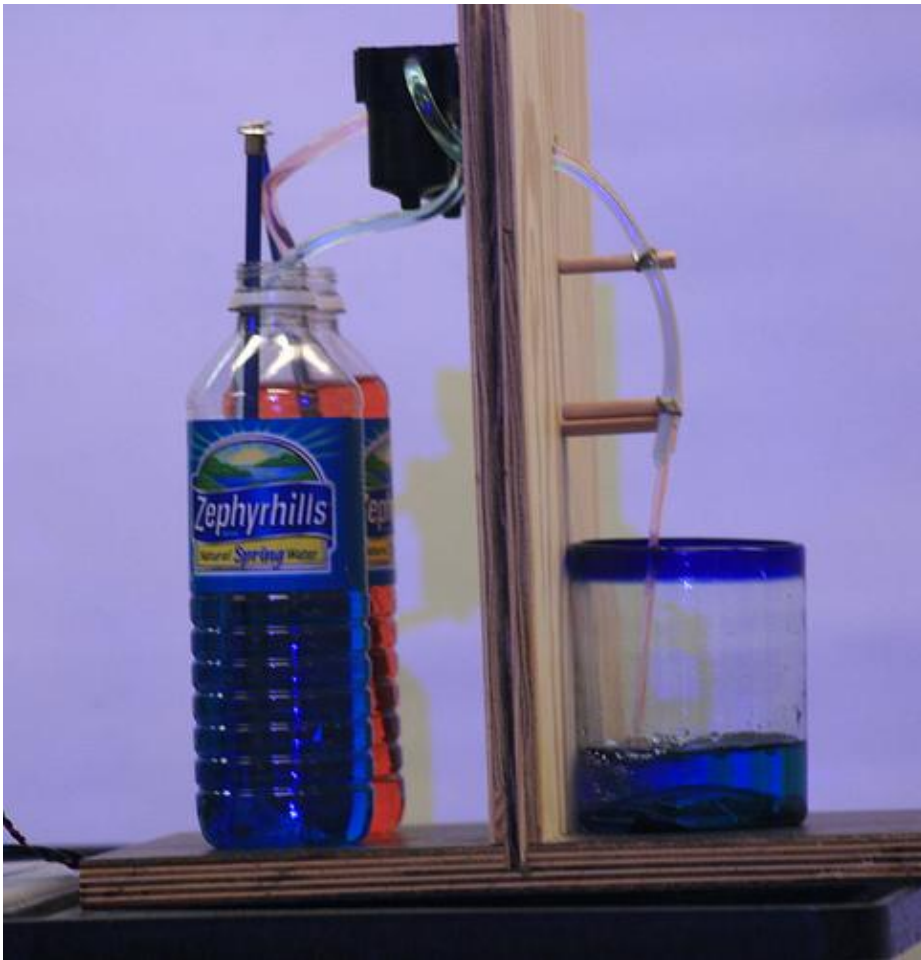


<http://rgbledcoat.blogspot.com/>

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# Fun - Barduino

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<http://www.matthewdavidwilliams.com/2008/10/17/introducing-barduino-the-ruby-powered-bar-monkey/>

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# Fun - Demo

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Led Cube

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