Intro to Arduino

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Overview

What is an Arduino?

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  - Based on the megaAVR series of microcontrollers

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- Open source hardware
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- Open source software
  - Cross Platform IDE
  - Wiring

Arduino Components

What's actually on a "standard" Arduino?

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- Microcontroller - ATmega328
- Processor - 16MHz
- Flash Memory - 32KB
- SRAM - 2KB
- EEPROM - 1KB
- Digital I/O Pins - 14 (6 PWM)
- Analog Input Pins - 6

Arduino Hardware

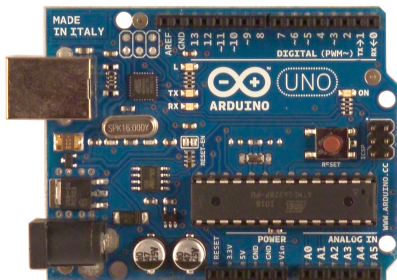So the Arduino's just a single opensource microcontroller
with some software, right?

Arduino Hardware

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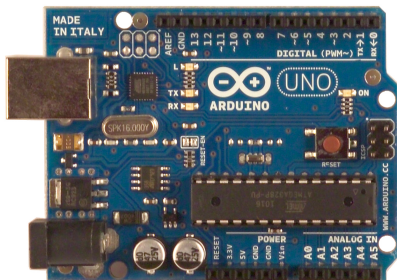with some software, right?
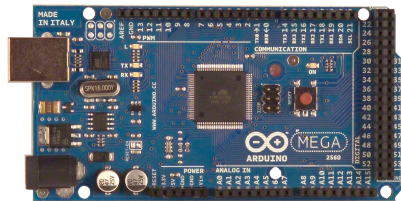
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Arduino Variations

Arduino Variations

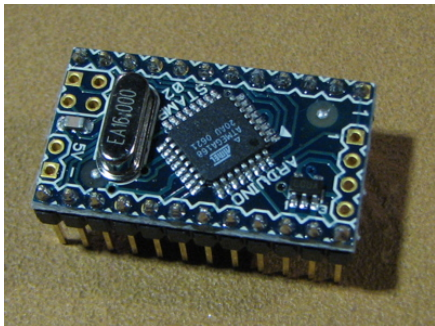

Arduino Uno

Arduino Variations

Arduino Uno
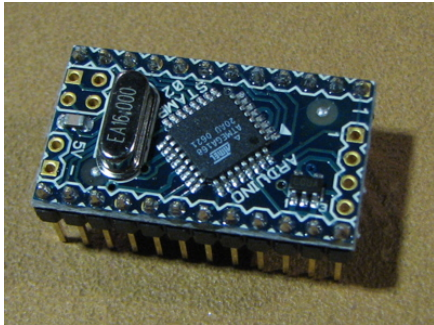

Arduino Mega2560

Arduino Variations

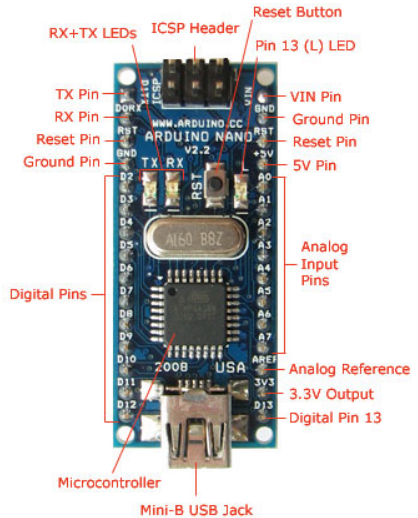# Arduino Variations

Arduino Mini
The smallest Arduino

Arduino Variations

Arduino Mini
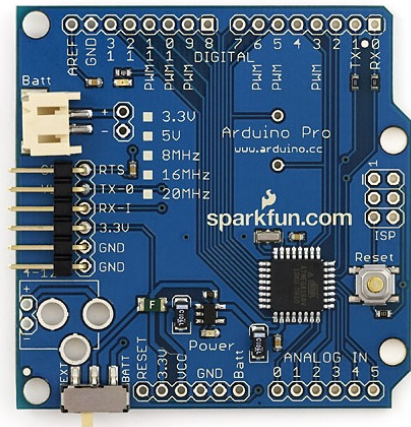The smallest Arduino

Arduino Nano

Arduino Variations

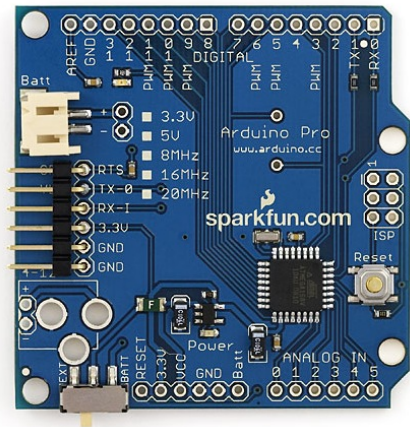# Arduino Variations

Arduino Bluetooth

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Arduino Fio

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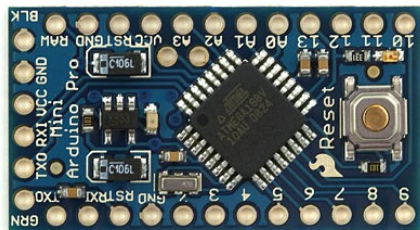
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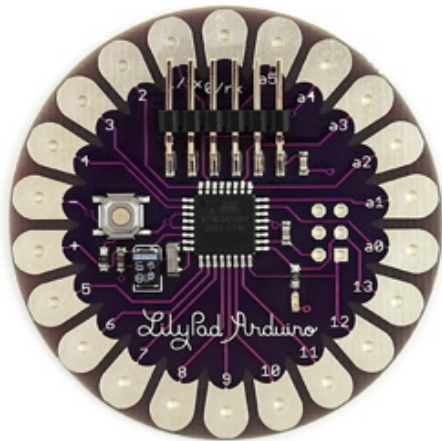

Arduino Pro

Arduino Variations

Arduino Pro

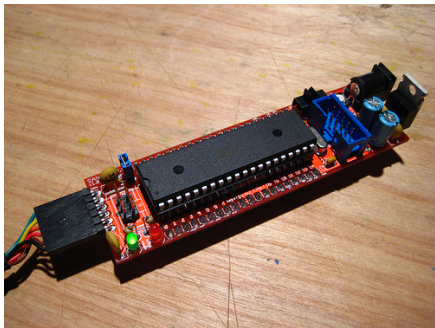Arduino Pro Mini

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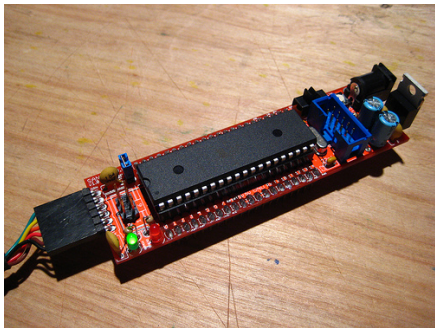

Arduino Lilypad

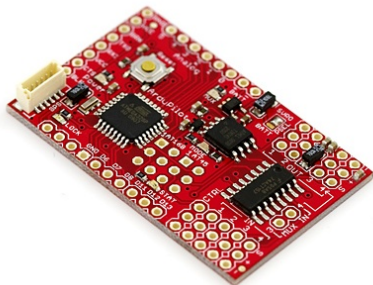# Arduino Clones

Arduino Clones

Sanguino
Uses the ATmega644P

Arduino Clones

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ArduPilot

Arduino Interaction

But I want to make my Arduino *do* something.
How do I get the Arduino to interact with anything?

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How do I get the Arduino to interact with anything?

The obvious answer:
Hook some peripheral devices up to the Digital or Analog I/O pins.

Shields

The more interesting answer?

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Shields

These are the plugins of the Arduino world
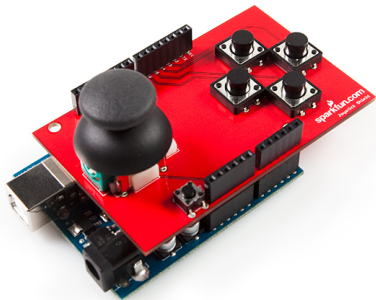
Allows Arduino users to easily extend their arduino's capabilities

Shield Examples

Shield Examples

Touch Shield from liquidware

Joystick Shield

Software Overview

Okay, so there's a lot of hardware
What about the software side?

Software Stack

- Cross Platform IDE
- Uses the Wiring library
- Uses the GNU toolchain and AVR Libc to compile
- Uploads to the Arduino via avrdude

Wiring

- Software library originally written for a project of the same name
- C/C++
- Provides convenient shortcuts when writing microcontroller code

Code

Arduino code only two functions to be present in order to run

- void setup() - this gets run at boot time
- void loop() - this function is repeatedly called until the board is powered off

Questions?
Comments?