Arduino Input and Output

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2010 April 27
6:30-8:30 PM
Today we'll be covering:

- PWM
- LED brightness
- Analog Input
- Servos
PWM

Create a time averaged analog value by pulsing a digital value
25% duty cycle: average 1.25V

50% duty cycle: average 2.5V

75% duty cycle: average 3.75V
LED brightness

[Diagram showing a basic circuit with a resistor (R1), LED (LED1), and connections to PIN6 and GND.]
LED brightness

```c
int LED = 6;

void setup() {
  //no pinMode for analogWrite
}

void loop() {
  //write an analog value for use with PWM
  analogWrite(LED, 70);
}
```
Analog Input
Analog Input

```c
int LED = 6;  // digital pin 6
int analogIn = 0;  // analog pin 0

void setup() {
    // no pinMode for analogWrite
    // no pinMode for analogRead
}

void loop() {
    // input value is between 0 and 1024
    int value = analogRead(analogIn);
    // scale value so that it is between 0 and 255
    value = value / 4;
    // write an analog value for use with PWM
    analogWrite(LED, value);
}
```
Servos

Pin10
5V

orange
dark red
dark brown

GND
Servos

#include <Servo.h>

int LED = 6;  //digital pin 6
int analogIn = 0;  //analog pin 0
int servoPin = 10;

Servo myMotor;  //make the motor exist

void setup() {
  //no pinMode for analogWrite
  //no pinMode for analogRead
  myMotor.attach(servoPin);  //tell the motor which pin
}

void loop() {
  //input value is between 0 and 1024
  int value = analogRead(analogIn);
  //scale value so that it is between 0 and 255
  value = value / 4;
  //write an analog value for use with PWM
  analogWrite(LED, value);
  myMotor.write(value);
}