Day 2 – 4/9/2011
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Nightlight

- Also measures darkness

Photoresistor
Summary – 4/2/2011

- Orientation with software and hardware
- Learned about pins on Arduino
- Communication between computer and Arduino
- Coding rules
  - //comments
  - Semicolons at the end of every line;
- Electrical rules
Arduino Board

Path to Computer

Digital
- Reset
- +5 clock
- +5 photoresistor
- GND photoresistor
- GND clock

Analog
- to pin 1 clock
- to pin 2 clock

to the photoresistor
Communication Overview

**Computer**
- Programs
- Arduino
- Messenger

**Arduino**
- Does the work
- Embedding the code

**Input/Output**
- Arduino reads input and writes output
LED Circuit

Light up LED on Arduino and a red LED
ButtonRead

ButtonRead Communication

Computer
- Programs Arduino

Arduino
- Stores program

Input/Output
- Button not pressed
- Pin 2 = LOW
ButtonRead Communication

**Computer**
- Serial Monitor on

**Arduino**
- Reads button

**Input/Output**
- Button not pressed
- Pin 2 = LOW
Button Read Communication

Computer
- Serial Monitor on

Arduino
- Sends 0’s if not pressed

Input/Output
- Button not pressed
- Pin 2 = LOW
ButtonRead Communication

**Computer**
- Serial Monitor on
- Displays 0’s

**Arduino**
- Sends 0’s if not pressed

**Input/Output**
- Button not pressed
- Pin 2 = LOW
**ButtonRead Communication**

**Computer**
- Serial Monitor on
- Displays 0’s

**Arduino**
- Reads button

**Input/Output**
- Button pressed
- Pin 2 = HIGH
ButtonRead Communication

Computer
- Serial Monitor on

Arduino
- Sends 1’s if pressed

Input/Output
- Button pressed
- Pin 2 = HIGH
**ButtonRead Communication**

**Computer**
- Serial Monitor on
- Displays 1’s

**Arduino**
- Sends 1’s if pressed

**Input/Output**
- Button pressed
- Pin 2 = HIGH

USB | Wires
ButtonRead Communication

Computer
- Programs Arduino
- Displays 0’s or 1’s

Arduino
- Reads button
- Sends 0’s or 1’s

Input/Output
- Button pressed
  -> Pin 2 = HIGH
- Button not pressed
  -> Pin 2 = LOW
How the Button Works

Button not pressed
- Top two legs connected, and bottom two legs connected

Make sure legs face sideways!!
How the Button Works

Button pressed
- All four legs connected

Make sure legs face sideways!!
const int button = 2; //const means no change

void setup() {
  pinMode(button, INPUT);
}

void loop() {
  int buttonState = digitalRead(button);
}
Writing to the Computer

```cpp
void setup() {
  Serial.begin(9600);
}

void loop() {
  Serial.println(??????, DEC);
}
```
ButtonRead

Streams of 1’s and 0’s on computer based on button press
Writing to the Computer

- Did you find Serial.println useful?
- If so, why?
Writing to the Computer

- Did you find Serial.println useful?
- If so, why?

- Can be used to find problems in your program
  - Did this line actually run?
    - HINT: stick a Serial.println(“message”) after the line
  - What is the value of this variable?
    - HINT: stick a Serial.println(variable) when you measure
Hands On Activity

Computer Science Unplugged