

SPIRIA

**THINK.
CODE.
COLLABORATE.**

www.spiria.com

Rise of the Nodebots

Presented By

JOEL LORD

ConUHacks
January 21st, 2017

About me

JOEL LORD



- Javascript Junkie
- Technology enthusiast
- Tinkerer

SPIRIA

SPIRIA

 @joel__lord
@ConUHacks

What about your friend there? MY NODEBOT



SPIRIA

 @joel_lord
@ConUHacks

AGENDA

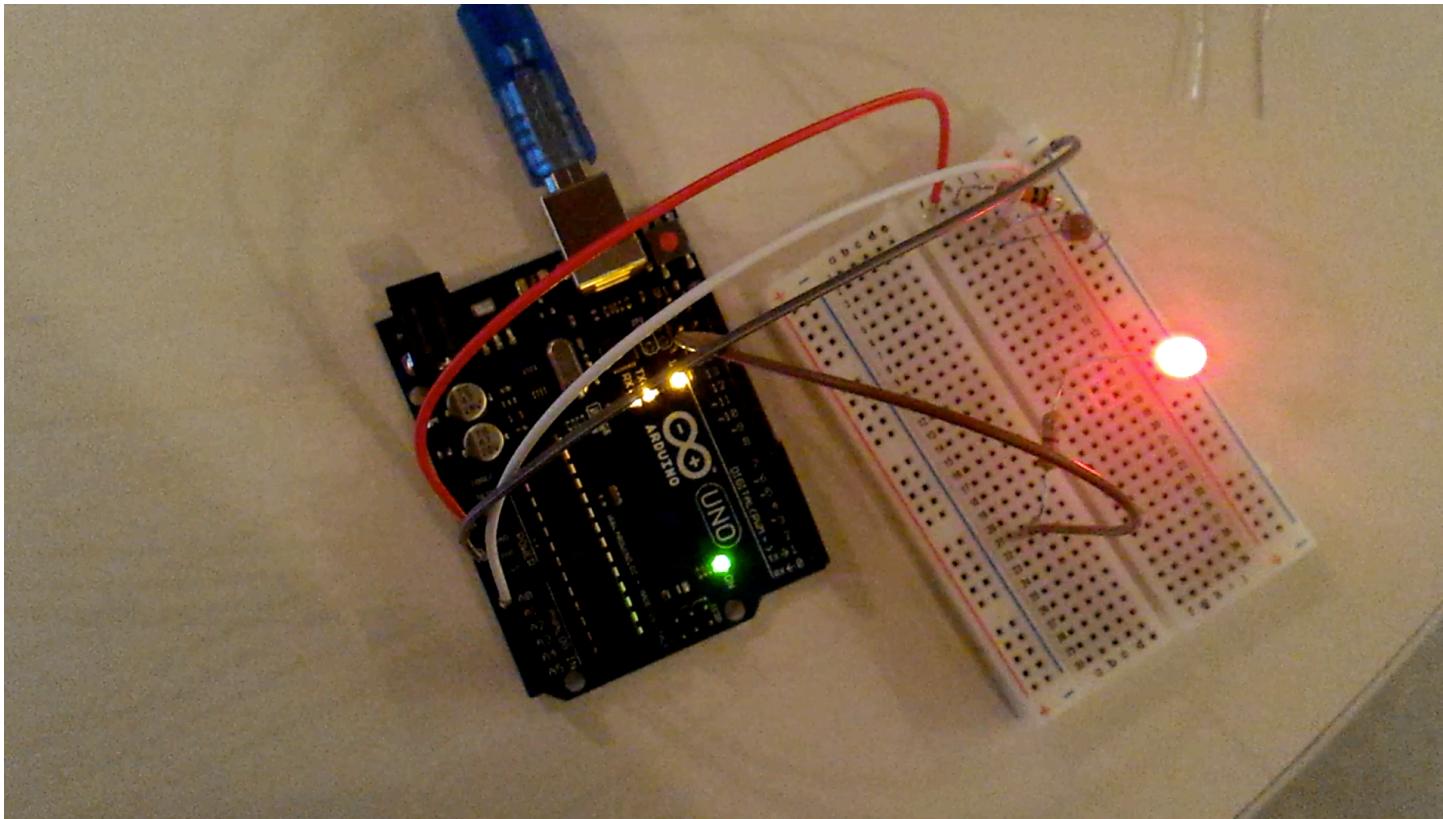
Demo
Hardware
Software
Setting up the Arduino board
Setting up the project
Building a Hello World!
Building the Night light

CROSS YOUR FINGERS

Demo Time!

Demo

A SIMPLE AND CUMBERSOME NIGHT LIGHT



SPIRIA

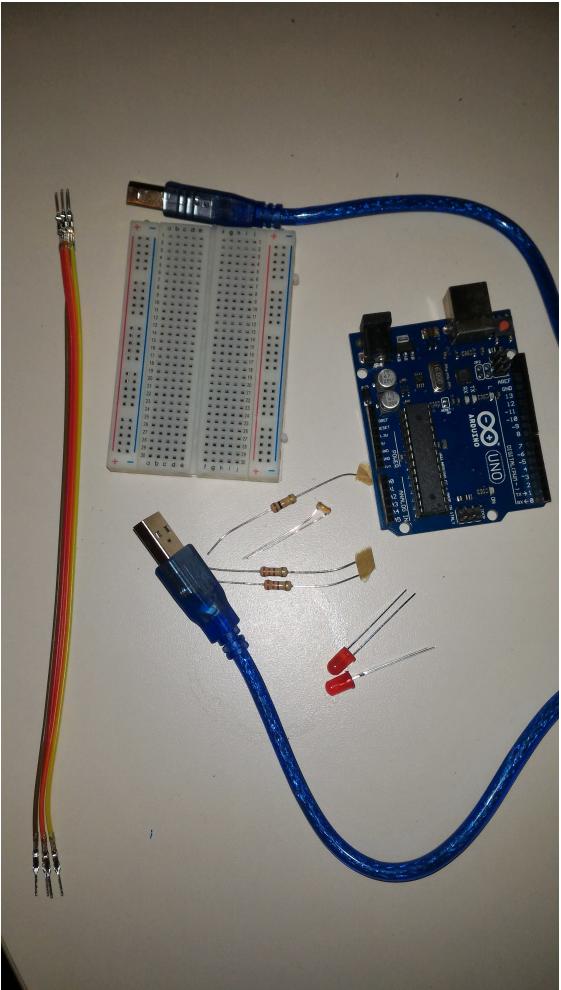
 @joel__lord
@ConUHacks

CHECK YOUR PARTS

Your Kit

Your Kit

LIST OF COMPONENTS



SPIRIA

- 1 Arduino board
- 1 USB Cable
- 1 Breadboard
- 4 Jumper Cables
- 2 Red LEDs
- 2 220 ohms Resistors
- 1 Photoresistor
- 1 1k ohms Resistor

 @joel__lord
@ConUHacks

COVERING THE BASICS

Hardware

Hardware

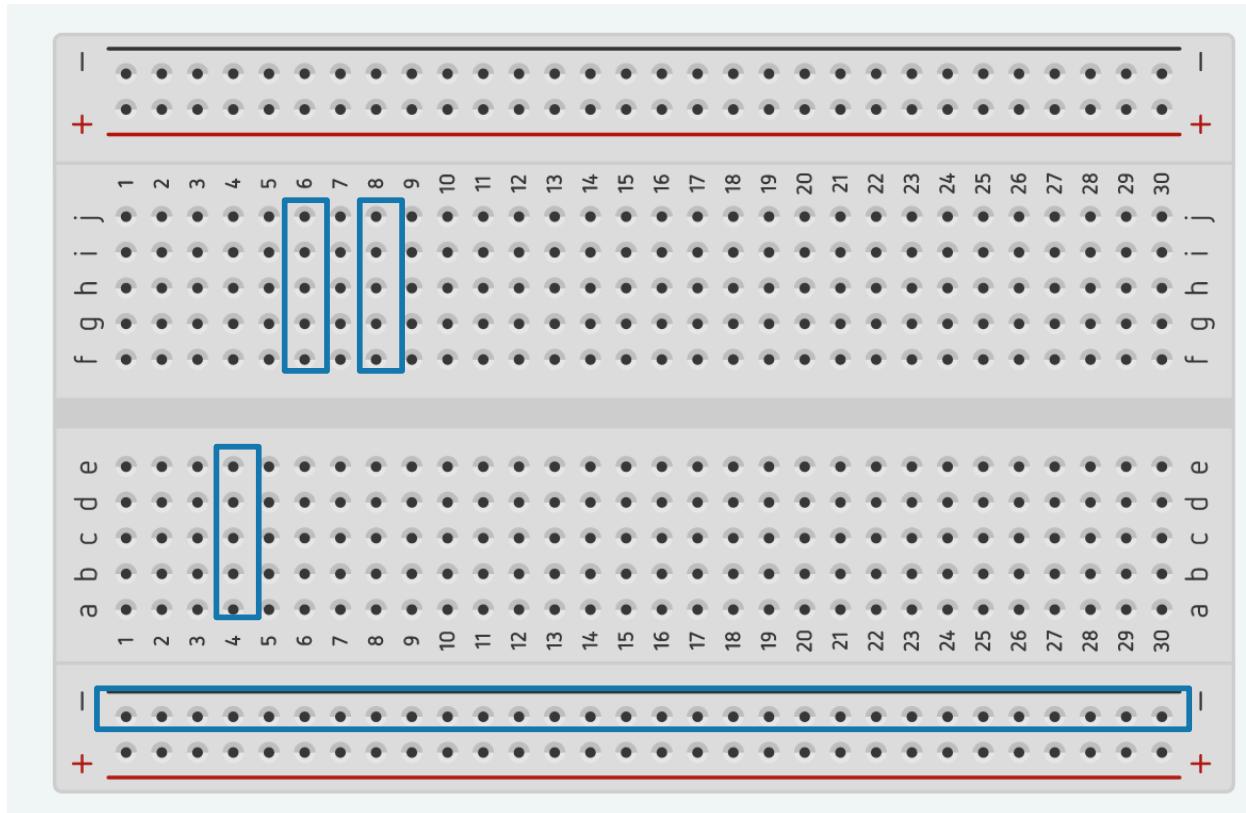
ARDUINO



- Open Source hardware and software
- Uses an ATMega programmable chip
- Programmable in C
- We can use the serial port to send instructions using the Standard Firmata (<https://github.com/firmata/arduino>)

Hardware

HOW BREADBOARD WORKS



SPIRIA

 @joel__lord
@ConUHacks

Hardware

RESISTORS AND OHMS LAW

SPIRIA

 @joel__lord
@ConUHacks

COVERING THE BASICS

Software

Software

NODE.JS



- JavaScript runtime built on Chrome's V8 JavaScript engine.
- Open Source and available freely
- Available at
<https://nodejs.org/>

Software

NPM

- Node Package Manager
- Comes out of the box with NodeJs
- Available at
<https://www.npmjs.com/>

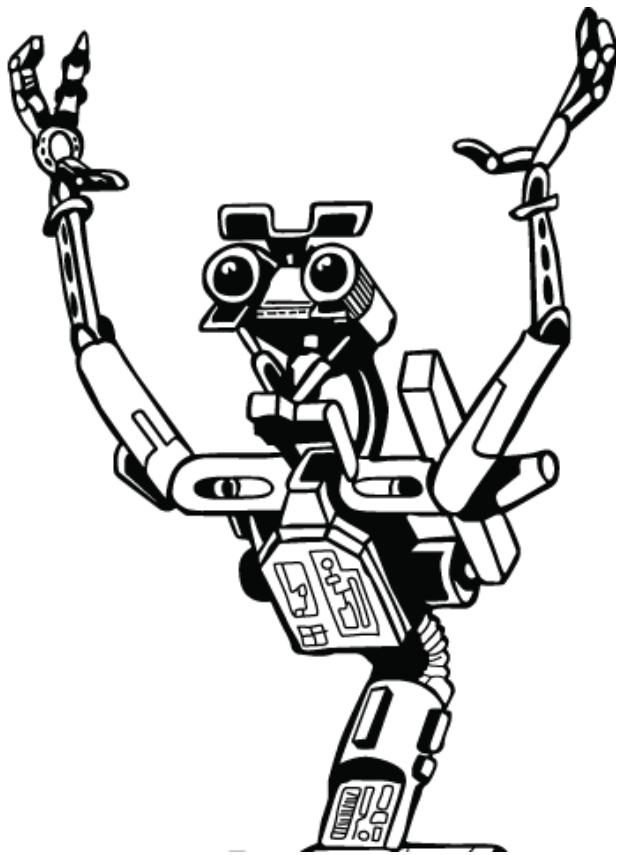


SPIRIA

 @joel__lord
@ConUHacks

Software

JOHNNY-FIVE



- Available through npm
- Documentation at
<http://johnny-five.io/>

SPIRIA

 @joel__lord
@ConUHacks

GETTING SERIOUS

Setting up the Arduino

Setting Up the Arduino

INSTALL THE STANDARD FIRMATA

- To enable communication with the serial port, you need the Standard Firmata Plus installed
- <https://github.com/firmata/arduino>
- All the boards today come pre-configured
- Still, here is how to install it

GETTING SERIOUS

Setting up the project

Setting Up the project

NPM INIT AND DEPENDENCY INSTALL

- Create a new project using npm init
- Install Johnny-Five using npm install --save johnny-five

Setting up the project

NPM INIT

```
> npm init

name: (test)
version: (1.0.0)
description:
entry point: (index.js)
test command:
git repository:
keywords:
author:
license: (ISC)
About to write to /Users/jlord/Documents/Projects/test/package.json:
```

```
{
  "name": "test",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "author": "",
  "license": "ISC"
}
```

Is this ok? (yes)

SPIRIA

 @joel__lord
@ConUHacks

Setting up the project

NPM INSTALL

```
> npm install --save johnny-five
```

```
npm WARN package.json test@1.0.0 No description
npm WARN package.json test@1.0.0 No repository field.
npm WARN package.json test@1.0.0 No README data
\
> serialport@4.0.7 install /Users/jlord/Documents/Projects/test/node_modules/johnny-five/node_modules/serialport
> node-pre-gyp install --fallback-to-build
```

```
[serialport] Success: "/Users/jlord/Documents/Projects/test/node_modules/johnny-
five/node_modules/serialport/build/Release/serialport.node" is installed via remote
johnny-five@0.10.6 node_modules/johnny-five
|   └── lodash.debounce@4.0.8
|   └── lodash.clonedeep@4.5.0
|   ├── ease-component@1.0.0
|   ├── color-convert@1.2.2
|   ├── browser-serialport@2.1.0
|   ├── temporal@0.5.0
|   ├── nanotimer@0.3.10
|   ├── firmata@0.15.0
|   ├── chalk@1.1.3 (escape-string-regexp@1.0.5, ansi-styles@2.2.1, supports-color@2.0.0, has-ansi@2.0.0, strip-ansi@3.0.1)
|   ├── es6-shim@0.35.2
└── serialport@4.0.7 (bindings@1.2.1, commander@2.9.0, lie@3.1.0, debug@2.6.0, nan@2.5.0, object.assign@4.0.4)
```

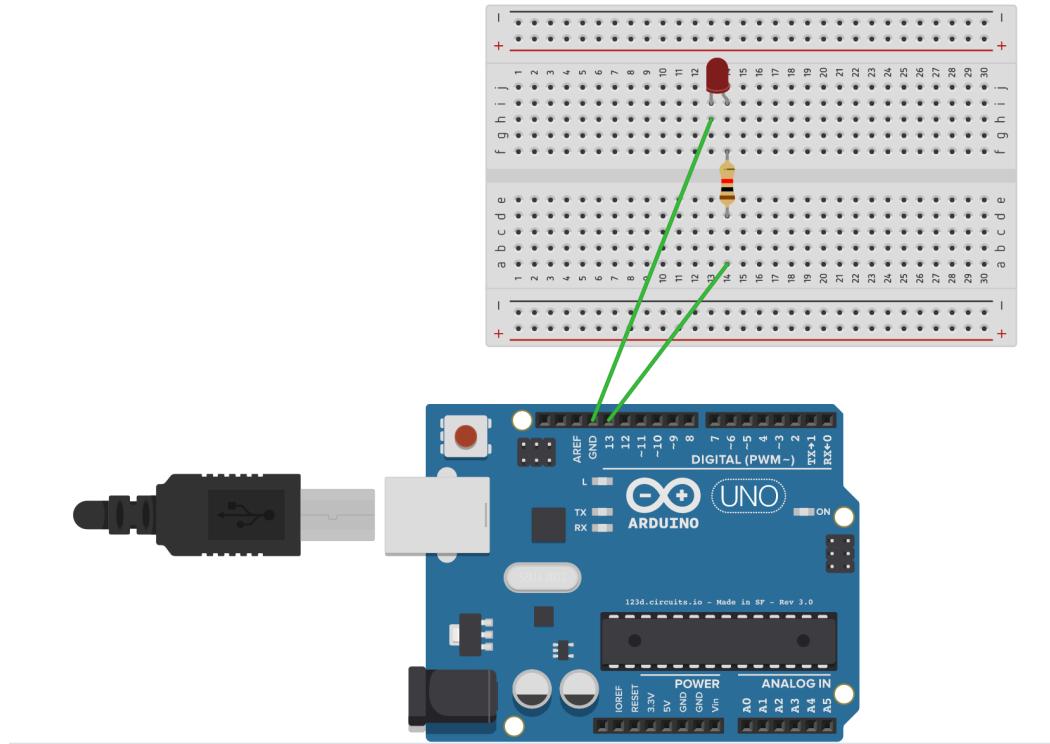
GETTING SERIOUS

Hello World !

Hello World

WIRING UP THE LED

- Wire up the LED



SPIRIA

 @joel__lord
@ConUHacks

Hello World

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");

var board = new j5.Board();

board.on("ready", function() {
  var led = new j5.Led(13);
  led.blink(500);
});
```

Hello World

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");

var board = new j5.Board();

board.on("ready", function() {
  var led = new j5.Led(13);
  led.blink(500);
}) ;
```

Hello World

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");

var board = new j5.Board();

board.on("ready", function() {
  var led = new j5.Led(13);
  led.blink(500);
});
```

Hello World

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");

var board = new j5.Board();

board.on("ready", function() {
  var led = new j5.Led(13);
  led.blink(500);
});
```

Hello World

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");

var board = new j5.Board();

board.on("ready", function() {
  var led = new j5.Led(13);
  led.blink(500);
}) ;
```

Hello World

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");

var board = new j5.Board();

board.on("ready", function() {
  var led = new j5.Led(13);
  led.blink(500);
});
```

Hello World

RUNNING THE SCRIPT

- Run the Node script

```
➤ node hello.js  
1484955651472 Device(s) /dev/cu.usbmodem1421  
1484955651484 Connected /dev/cu.usbmodem1421  
1484955653114 Repl Initialized
```

```
➤
```

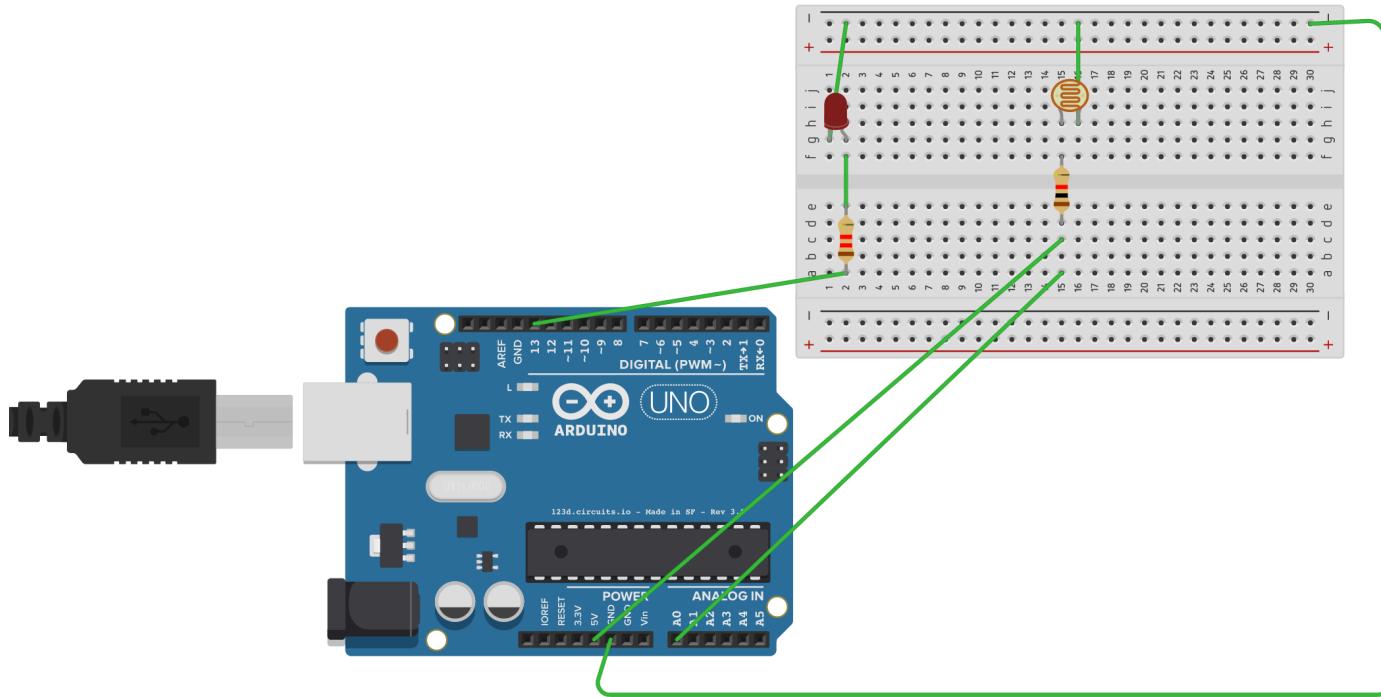
GETTING SERIOUS

Finishing the Night light

Night Light

THE CODE

- Wire up the Photoresistor and tweak the layout



SPIRIA

@joel__lord
@ConUHacks

Night Light

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");
var board = new j5.Board();
board.on("ready", function() {
  var led = new j5.Led(13);
  var sensor = new j5.Sensor("A0");
  sensor.on("change", function() {
    if (sensor.value > 750) {
      led.on();
    } else {
      led.off();
    }
  });
});
```

Night Light

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");
var board = new j5.Board();
board.on("ready", function() {
  var led = new j5.Led(13);
  var sensor = new j5.Sensor("A0");
  sensor.on("change", function() {
    if (sensor.value > 750) {
      led.on();
    } else {
      led.off();
    }
  });
});
```

Night Light

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");
var board = new j5.Board();
board.on("ready", function() {
  var led = new j5.Led(13);
  var sensor = new j5.Sensor("A0");
  sensor.on("change", function() {
    if (sensor.value > 750) {
      led.on();
    } else {
      led.off();
    }
  });
});
```

SPIRIA

 @joel__lord
@ConUHacks

Night Light

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");
var board = new j5.Board();
board.on("ready", function() {
  var led = new j5.Led(13);
  var sensor = new j5.Sensor("A0");
  sensor.on("change", function() {
    if (sensor.value > 750) {
      led.on();
    } else {
      led.off();
    }
  });
});
```

Night Light

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");
var board = new j5.Board();
board.on("ready", function() {
  var led = new j5.Led(13);
  var sensor = new j5.Sensor("A0");
  sensor.on("change", function() {
    if (sensor.value > 750) {
      led.on();
    } else {
      led.off();
    }
  });
});
```

Night Light

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");
var board = new j5.Board();
board.on("ready", function() {
  var led = new j5.Led(13);
  var sensor = new j5.Sensor("A0");
  sensor.on("change", function() {
    if (sensor.value > 750) {
      led.on();
    } else {
      led.off();
    }
  });
});
```

Night Light

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");
var board = new j5.Board();
board.on("ready", function() {
  var led = new j5.Led(13);
  var sensor = new j5.Sensor("A0");
  sensor.on("change", function() {
    if (sensor.value > 750) {
      led.on();
    } else {
      led.off();
    }
  });
});
```

Night Light

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");
var board = new j5.Board();
board.on("ready", function() {
  var led = new j5.Led(13);
  var sensor = new j5.Sensor("A0");
  sensor.on("change", function() {
    if (sensor.value > 750) {
      led.on();
    } else {
      led.off();
    }
  });
});
```

Night Light

THE CODE

- Create the index.js file

```
var j5 = require("johnny-five");
var board = new j5.Board();
board.on("ready", function() {
  var led = new j5.Led(13);
  var sensor = new j5.Sensor("A0");
  sensor.on("change", function() {
    if (sensor.value > 750) {
      led.on();
    } else {
      led.off();
    }
  });
});
```

Night Light

RUNNING THE SCRIPT

- Run the Node script

```
➤ node index.js

1484955651472 Device(s) /dev/cu.usbmodem1421
1484955651484 Connected /dev/cu.usbmodem1421
1484955653114 Repl Initialized
```

```
➤
```

SPIRIA

 @joel__lord
@ConUHacks

The End !

Questions ?

SPIRIA

THINK.
CODE.
COLLABORATE.

PRESENTED BY
JOEL LORD
January 21st, 2017

TWITTER: @JOEL__LORD
GITHUB: [HTTP://GITHUB.COM/JOELLORD](http://github.com/joellord)