

Introduction to Arduino

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RSI

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Introduction

Topics for today

- Blinking the built in LED (Hello World of Arduino)

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- Blinking the built in LED (Hello World of Arduino)
- Blinking an LED from the breadboard

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- Blinking the built in LED (Hello World of Arduino)
- Blinking an LED from the breadboard
- A simple stoplight demo

Blinking Light Demo

The Hello World of Arduino

Two Important Functions

In every arduino sketch you will have two functions

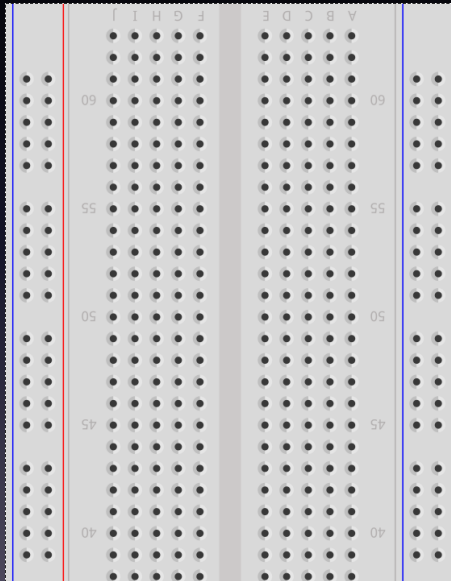
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- *setup()*
- This is where all of your setup code will go, and runs once, when the arduino is powered on or reset.
- *loop()*
- The main function of your program. An infinite loop that will do all the work.

Breadboard



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Resistors to the Rescue!

The most basic, and also important equation in electronics

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- R - Resistance

Calculate Minimum Required Resistance

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- $R = (5V - 2V) / 0.02A$
- $R = 150 \Omega$

Only One more Equation, I Promise!

$$P = V * I$$

$$P = I^2 * R$$

•

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- $P = 60\text{mW}$

Resistor Color Code

www.resistorguide.com

	Color	Significant figures			Multiply	Tolerance (%)	Temp. Coeff. (ppm/K)	Fail Rate (%)
Bad	black	0	0	0	x 1		250 (U)	
Beer	brown	1	1	1	x 10	1 (F)	100 (S)	1
Rots	red	2	2	2	x 100	2 (G)	50 (R)	0.1
Our	orange	3	3	3	x 1K		15 (P)	0.01
Young	yellow	4	4	4	x 10K		25 (Q)	0.001
Guts	green	5	5	5	x 100K	0.5 (D)	20 (Z)	
But	blue	6	6	6	x 1M	0.25 (C)	10 (Z)	
Vodka	violet	7	7	7	x 10M	0.1 (B)	5 (M)	
Goes	grey	8	8	8	x 100M	0.05 (A)	1(K)	
Well	white	9	9	9	x 1G			
Get	gold				x 0.1	5 (J)		
Some	silver			3rd digit only for 5 and 6 bands	x 0.01	10 (K)		
Now!	none					20 (M)		

6 band → 3.21kΩ 1% 50ppm/K

5 band → 521Ω 1%

4 band → 82kΩ 5%

3 band → 330Ω 20%

gap between band 3 and 4 indicates reading direction

(b) Resistor Color Code taken from <http://www.resistorguide.com/>

A Word of Caution

Danger

Delay is a blocking function. While delay is running you will not be able to read sensor inputs, compute mathematical calculations, or change pin outputs. An alternative is to use the *millis()* function instead.

A Couple of Helpful Resources

- Fritzing - <http://fritzing.org/home/>
- Arduino - <https://www.arduino.cc/>
- Basic Electronics - <https://www.electronics-tutorials.ws/>
- L^AT_EX - <https://www.sharelatex.com/>

Questions

Any Questions?