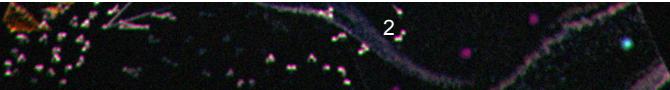


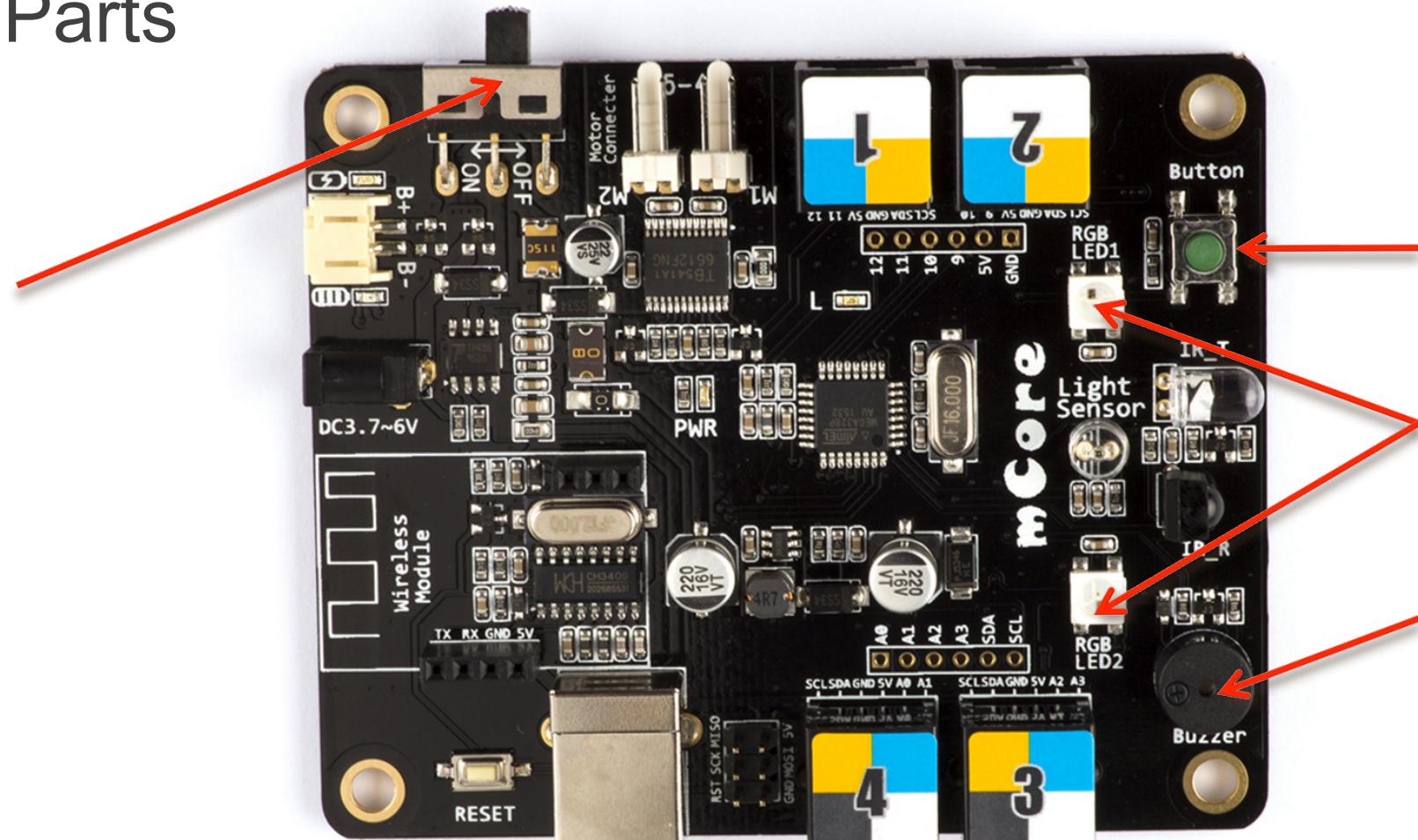
# mBot Training

April 2016 – Refugee Coding



# mBot Parts

Power  
Switch



Button

RGB LED

Buzzer - Sound

# Demonstrate Programming

- Blink the LEDs
  - RGB -> Red, Green, Blue
  - Set values for each color from 0 [off] to 255 [very bright]
  - You can mix Red, Green and Blue to make thousands of colors.

# Blink the lights



There are two leds you can control

LED stands for Light Emitting Diode.

Can you make them different colors?

Can you make them blink with sound?

# Demonstrate Programming

- Make Sounds with Buzzer
  - Play individual notes by setting note and duration.

# Play a Sound



Can you add a few more notes to play your favorite tune?

Notes for a few songs you might know:

C C G G A A G, F F E E D D C      Twinkle little star

F F F, F F F, F A D E F      Jingle Bells

A A A F C A F C A      Star Wars - Imperial March

# Hands On Lab

- Connect your mBot to the computer
- Make it blink the LEDs with different colors and play sounds

# Line Following

# What does it take to have a robot follow a line?

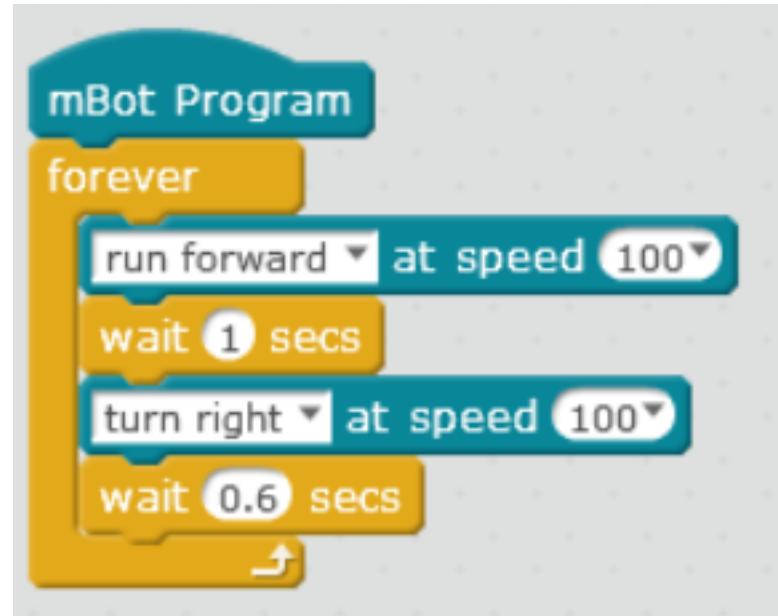
- Move



- See the line



# Moving



Can you adjust this to move in a square?  
Can you move in a circle?  
Can you spin?

Valid motor speeds are between -255 and 255.

0 stop  
50 is slow  
100 is medium  
200 is fast  
255 is fastest

What do negative values do?

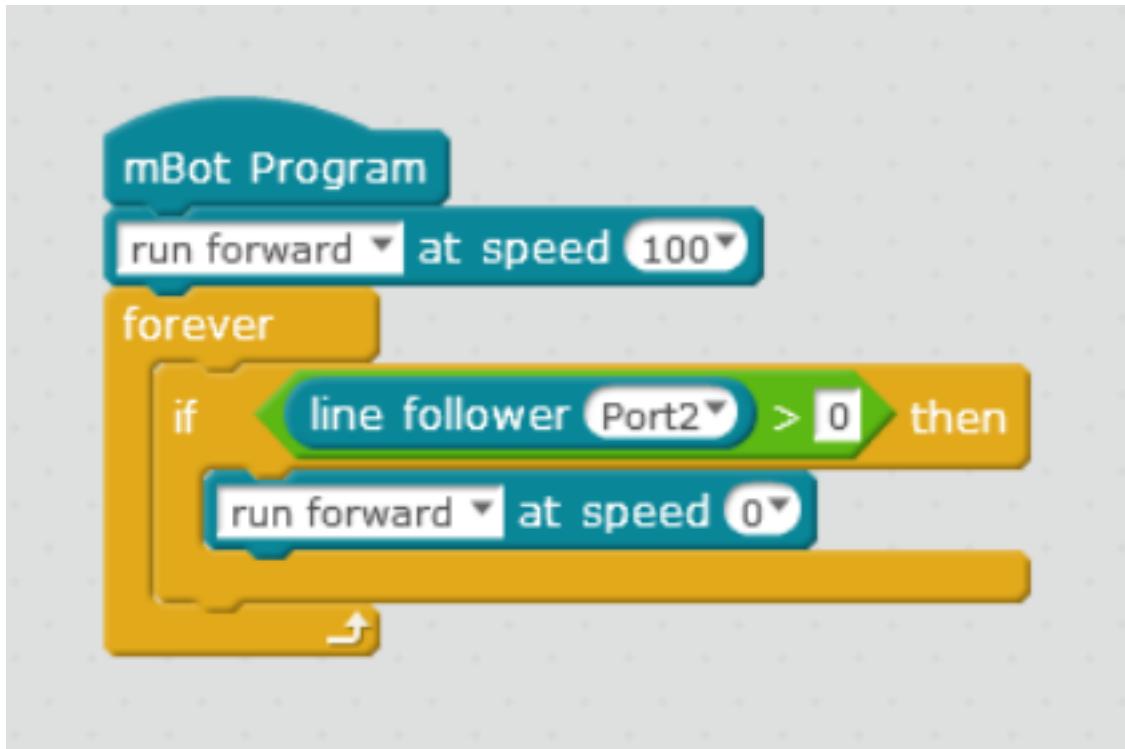
# Demonstrate uploading code

A screenshot of the Arduino IDE interface. At the top, there is a navigation bar with a 'Back' button on the left and a large blue 'Upload to Arduino' button on the right. A yellow arrow points from the text 'Upload code' in the main content area down to the 'Upload to Arduino' button. Below the navigation bar, the code editor displays three lines of C++ code:

```
1 #include <Servo.h>
2 #include <SoftwareSerial.h>
```

The numbers 1, 2, and 3 are displayed vertically on the far left of the code editor.

# Seeing



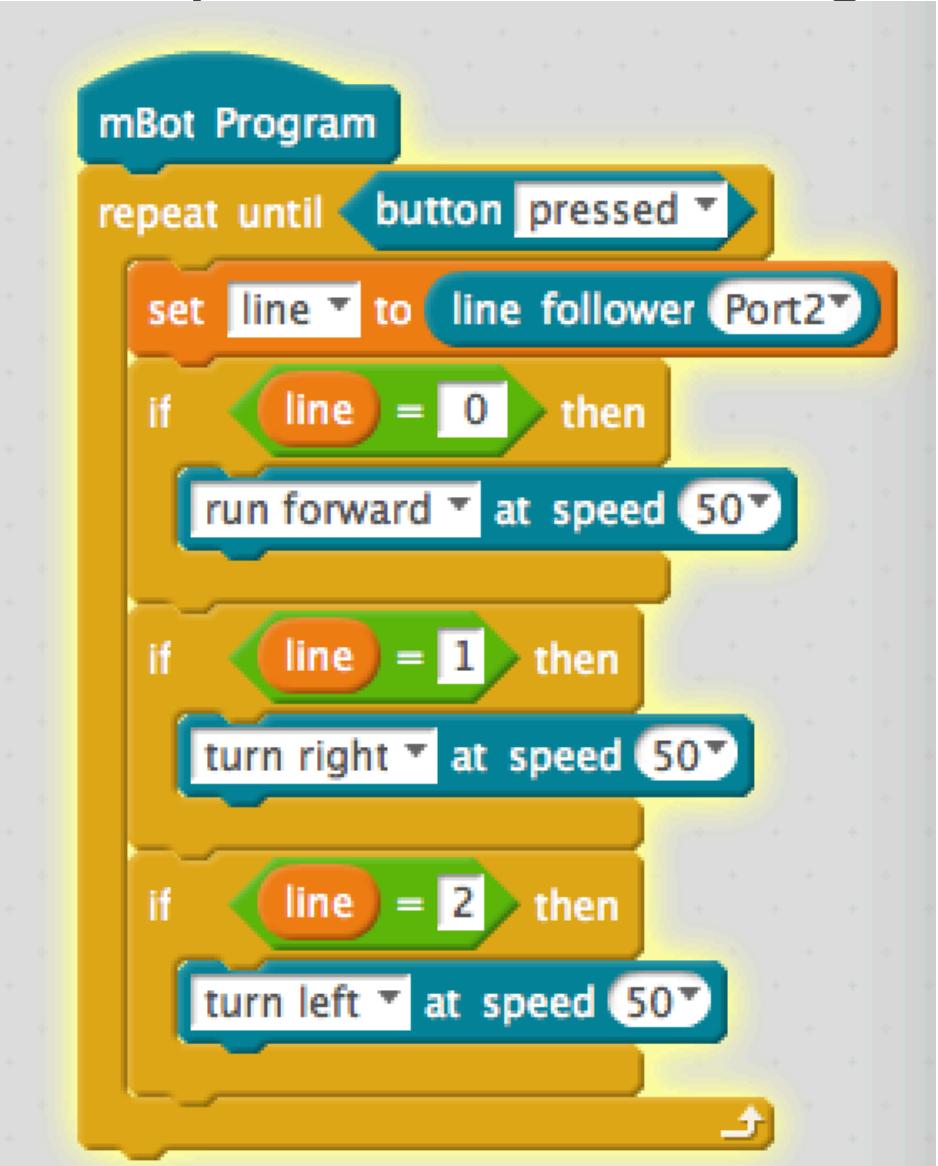
Start on white, stop on black.

Can you make sound when you stop?

Make the lights green when moving.

Make the lights red when you stop.

# Simple Line Following



The line follower has two detectors and 4 possible values.

0 means both detectors see black.

1 means one detector sees black, one white.

2 means one detector sees white, one black.

3 means both detectors see white.

Try to follow the figure 8 found in your box.

Can you fix the code shown so it works properly on your mBot?

Can you make your mBot go faster?

