

# Bonus EV3 Programming Lessons



Synchronized Lights Using  
the RGB LED Strip Controller  
by [Mindsensors.com](http://Mindsensors.com)



# RBG LED Strip Controller

- Purchase the RGB LED Strip Controller for EV3 or NXT from [Mindsensors.com](http://Mindsensors.com)
- Kit includes:
  - *EV3Lights controller*
  - *5 Meter RGB LED strip*
  - *12V Power adapter*
- Notes:
  - *Do not connect to motor port.*
  - *Do not use an input power supply greater than 12 volts DC.*

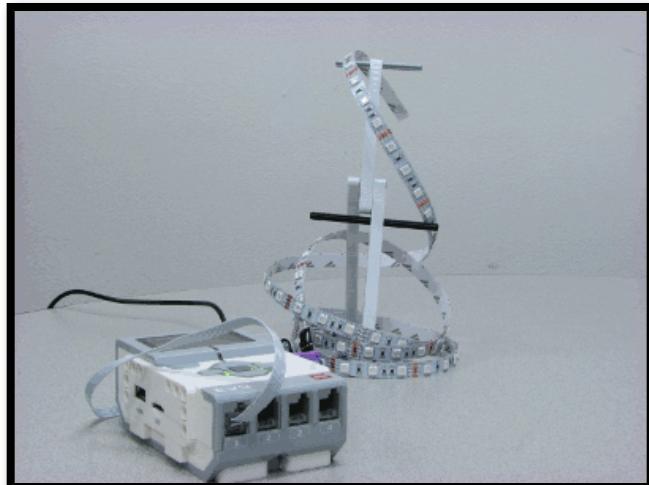


Image credit: [Mindsensors.com](http://Mindsensors.com)

# Project Description: Christmas Tree

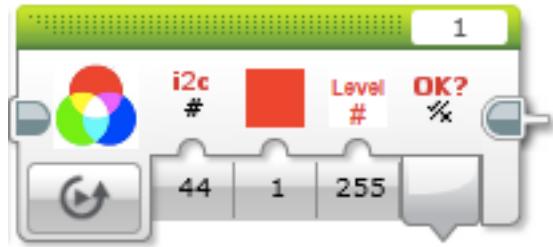
- Use the programmable LED strip and your EV3 to create an EV3-controlled Christmas Tree that is synchronized with music
- Create a tree from LEGO (or use a real tree)
- Weave the lights through the tree
- Play some Christmas music near the sound sensor and have the lights flash
- Have the lights randomly change colors



Photo credit: blast labs, Vassilis Chryssanthakopoulos

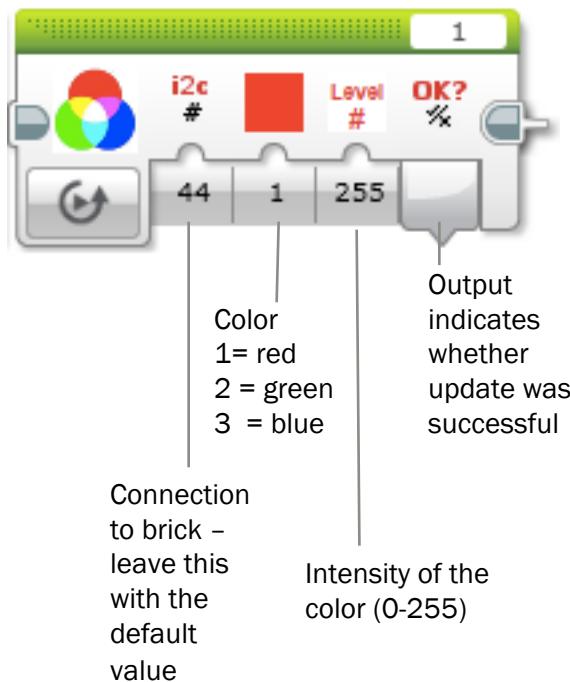
# Download Blocks

- If you need help, reviewing “Importing Third Party Blocks” lesson in Beyond on EV3Lessons.com
- Download the Mindsensors EV3Lights Block for the lights from the product page
  - [http://www.mindsensors.com/products/182-ev3lights-rgb-led-strip-controller-for-ev3-or-nxt?search\\_query=RGB+led+strip&results=1](http://www.mindsensors.com/products/182-ev3lights-rgb-led-strip-controller-for-ev3-or-nxt?search_query=RGB+led+strip&results=1)
- Download the NXT Sound Sensor Block from the LEGO.com page
  - <https://www.lego.com/en-us/mindstorms/downloads>



# Understanding the Blocks

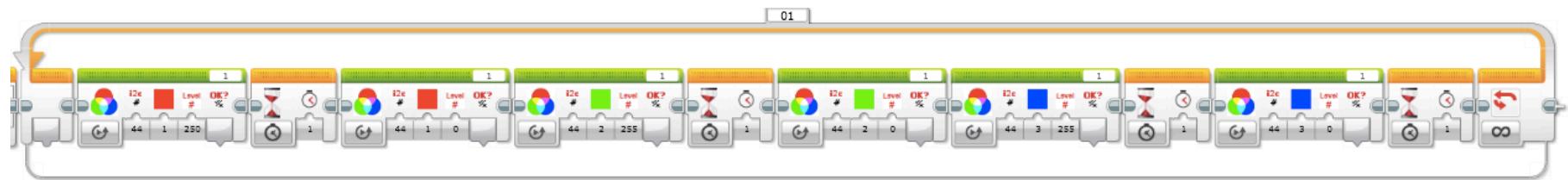
## ■ Mindsensors EV3Lights Block



Refer to the Introduction to Sound Sensor Lesson in Beginner if you need to learn to use the Sound Sensor block

# Download Sample EV3Lights Program

- The Sample Program can be useful to learn the basics.
  - [http://www.mindsensors.com/index.php?controller=attachment&id\\_attachment=332](http://www.mindsensors.com/index.php?controller=attachment&id_attachment=332)

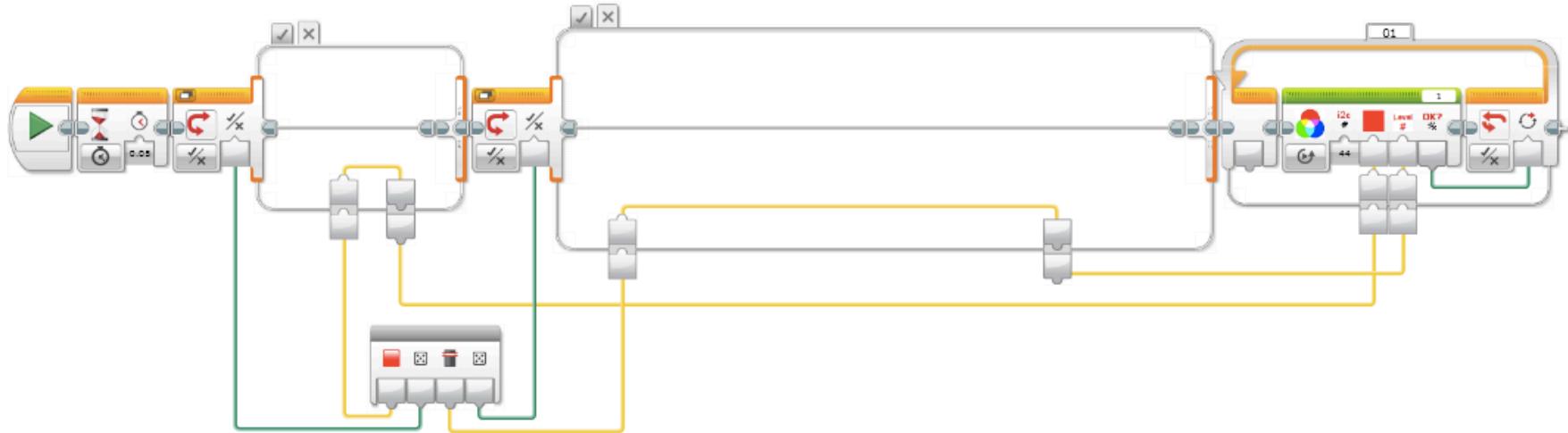


- What does this code do?
  - The light will flash red, wait a second, turns off (level = 0)
  - This repeats for green and blue
  - The entire code repeats forever

# FAQ

- **How do you turn off the lights?**
  - *Turn the intensity level to 0.*
  - *Note that it may blink each time you change colors. So, setting the value to 0 in a loop will cause flashing.*
- **What does Intensity mean?**
  - *Perhaps you don't want the colors on your tree to be as bright. Experiment with different intensity levels*
- **Why do the lights sometimes not change colors/turn off?**
  - *You may need a short pause between multiple updates to the lights. Rapid updates (e.g. in a loop) sometimes cause an update to be skipped.*
- **How do you get the colors other than Red, Green and Blue?**
  - *What about combinations of colors? Place multiple EV3Lights blocks next to each other. Can you make purple?*

# Create a MyBlock to Simplify Controls

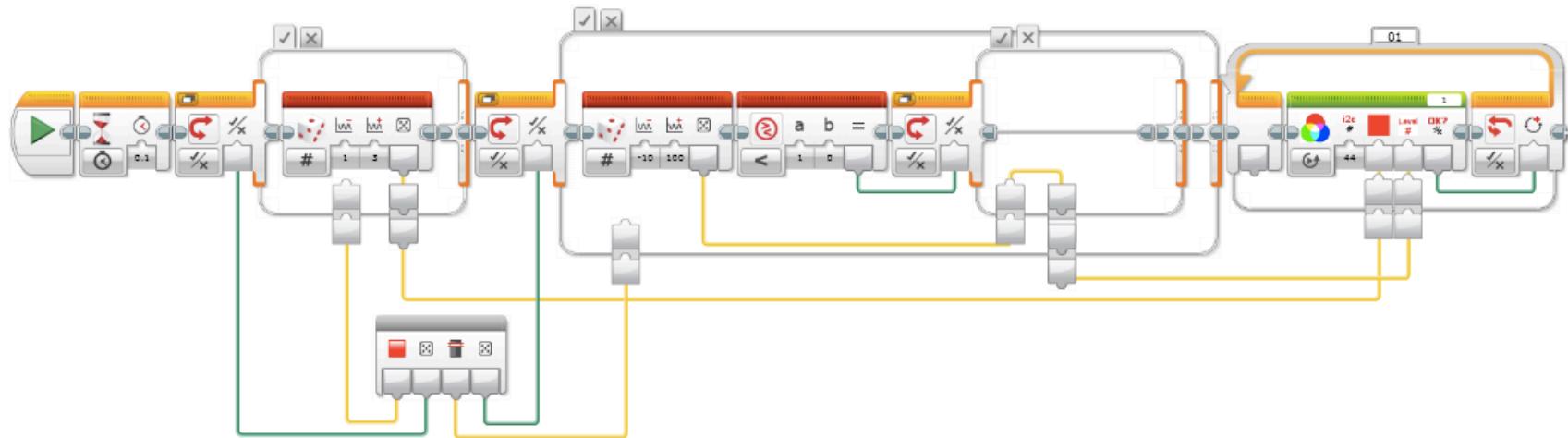


Wait block at the start ensures that we don't update the lights too rapidly. Reduces issue mentioned in FAQ.

Inputs: User can select which color to display (1-3) as well as intensity (0-255)

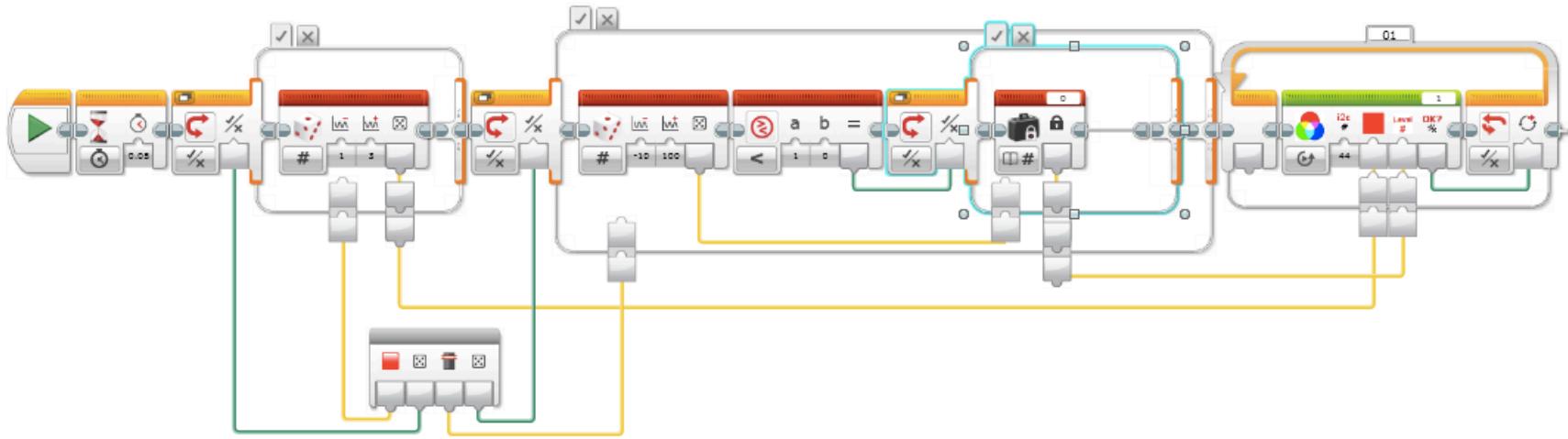
A loop at the end repeats the selection until it succeeds

# MyBlock Continued



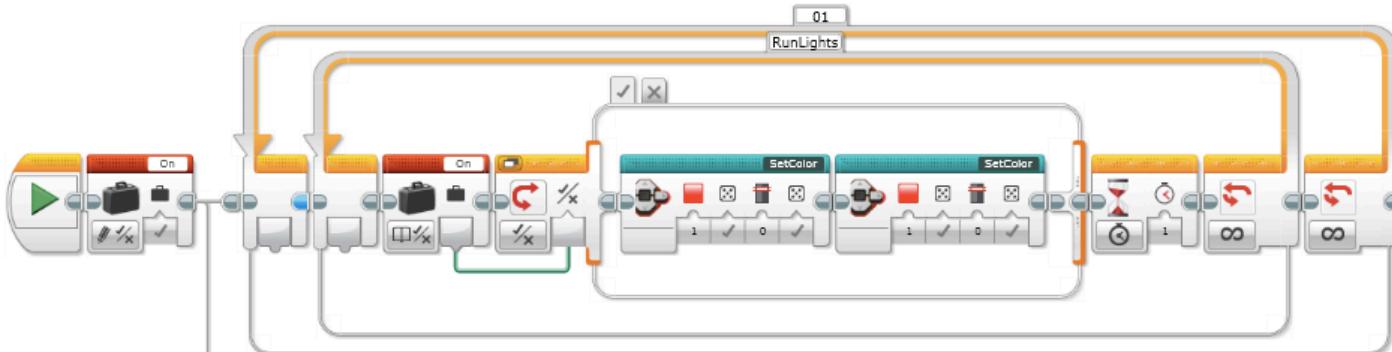
Inputs: User can request the choice of a random color and/or intensity. Random intensity range is set to 0-100 (because we preferred this range).

# MyBlock Continued



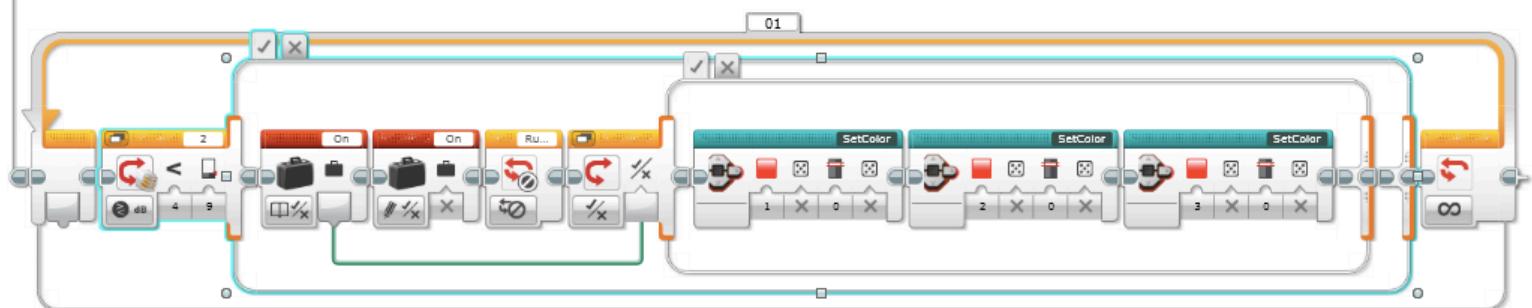
Inputs: The random intensity is set to 0 about 10% of the time for variety.

# Synchronized Lights Code



Colors change every one second.

Uses two different light colors when the sound level is “on”



Turns off colors when the sound level is “off” (no music)

# Next Steps: Ideas

- Can you have the intensity of the lights change as you get closer to the tree using your ultrasonic sensor?



# CREDITS

- This tutorial was created by Sanjay Seshan and Arvind Seshan
- More lessons are available at [www.ev3lessons.com](http://www.ev3lessons.com)



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