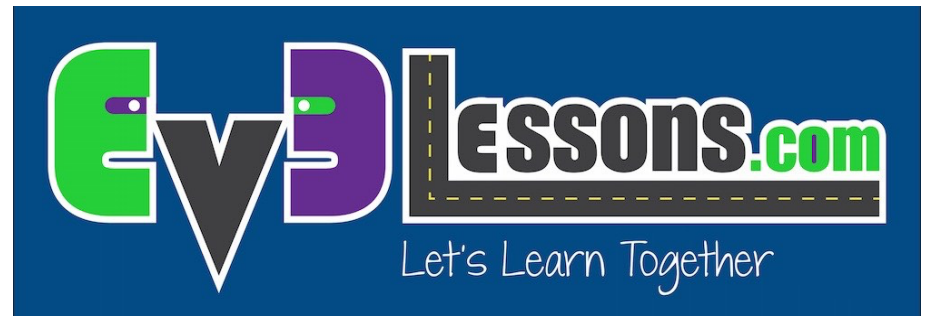


Bonus
EV3 Programming
Lessons



Synchronizing Lights Using
the RGB LED Strip Controller
by Mindsensors.com



RGB LED Strip Controller

- Purchase the RGB LED Strip Controller for EV3 or NXT from 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.*

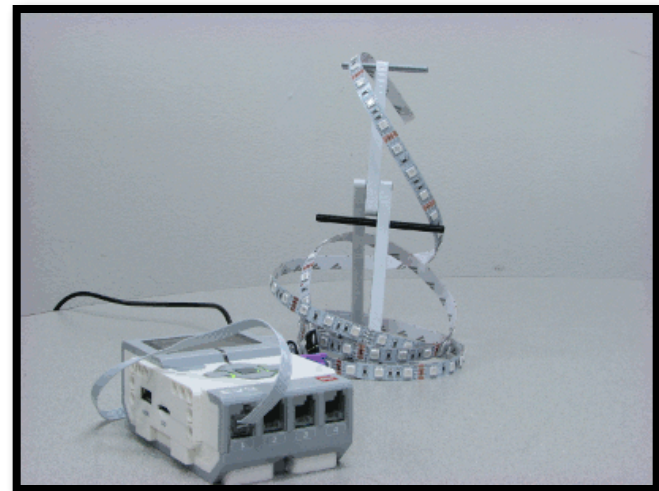


Image credit: Mindsensors.com

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

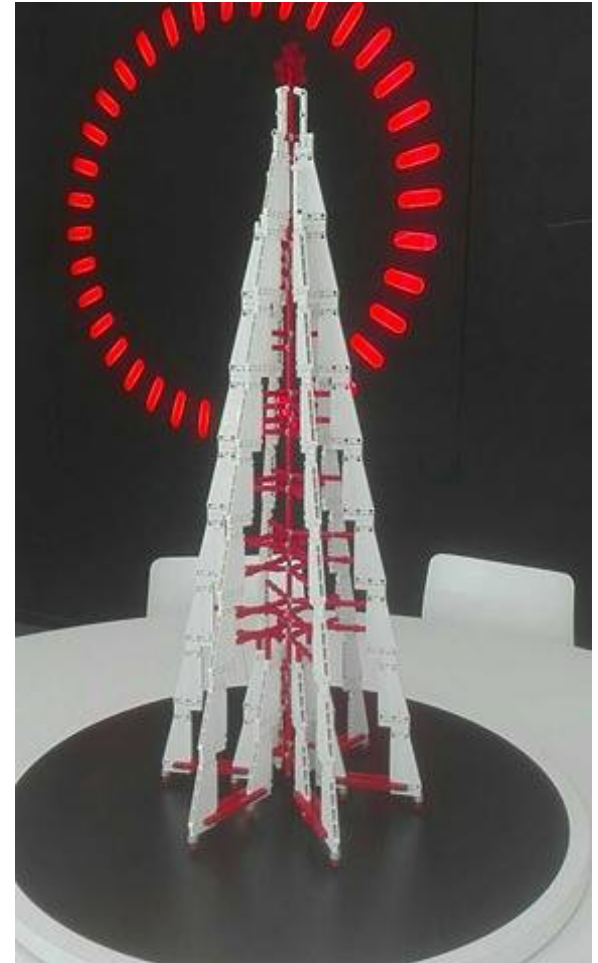
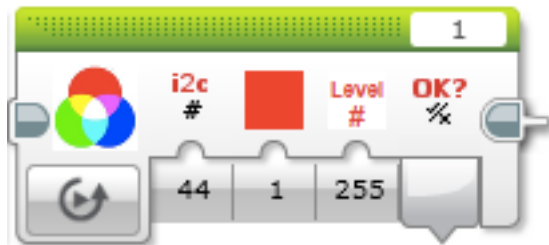


Photo credit: blast labs, Vassilis Chryssanthakopoulos

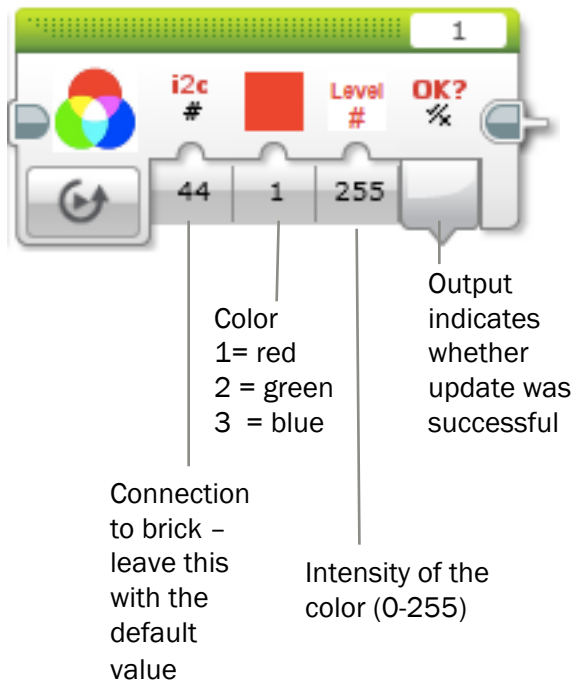
Download Blocks

- If you need help, reviewing “Importing Third Party Blocks” lesson in Beyond on EV3Lessons.com
- Download the Mindsensors EV3Lights Block for the lights for 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
- Download the NXT Sound Sensor Block from the LEGO.com page
 - <https://www.lego.com/en-us/mindstorms/downloads>



Understanding the Blocks

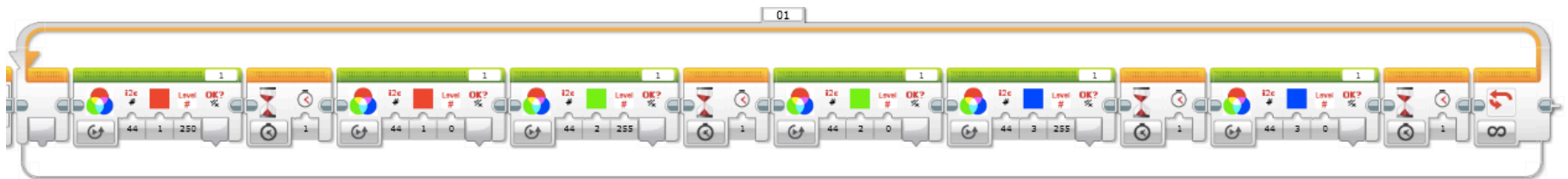
- Mindsensors EV3Lights Block



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



- 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*

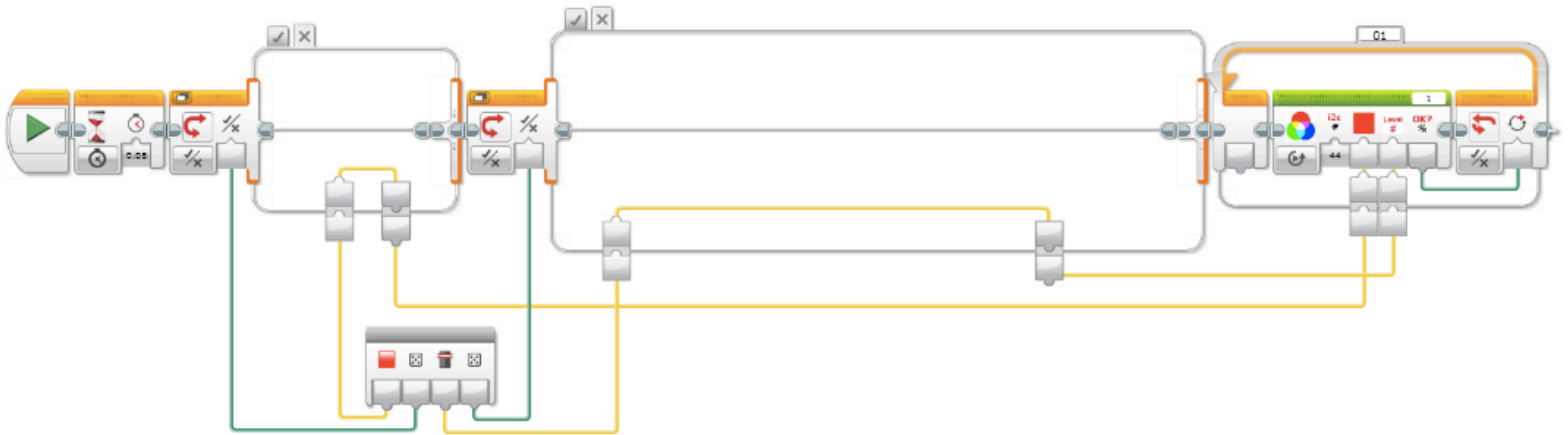
■ Why do the lights sometimes not change colors/turn off?

- *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

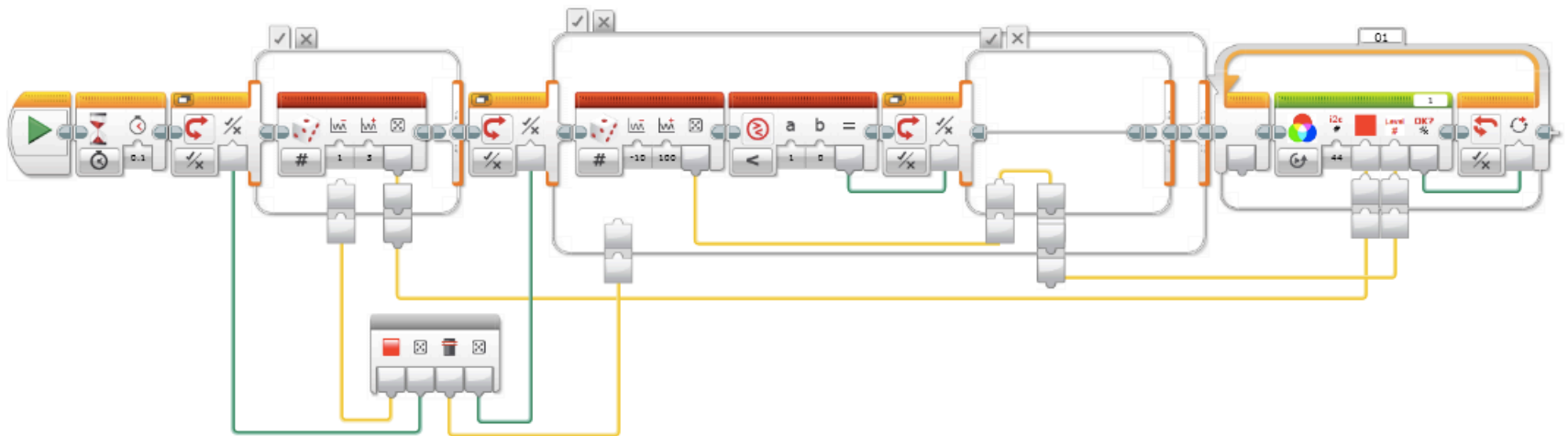


Wait block at the start ensures that we don't update the lights too rapidly. Reduces issue mentioned in FAQ.

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

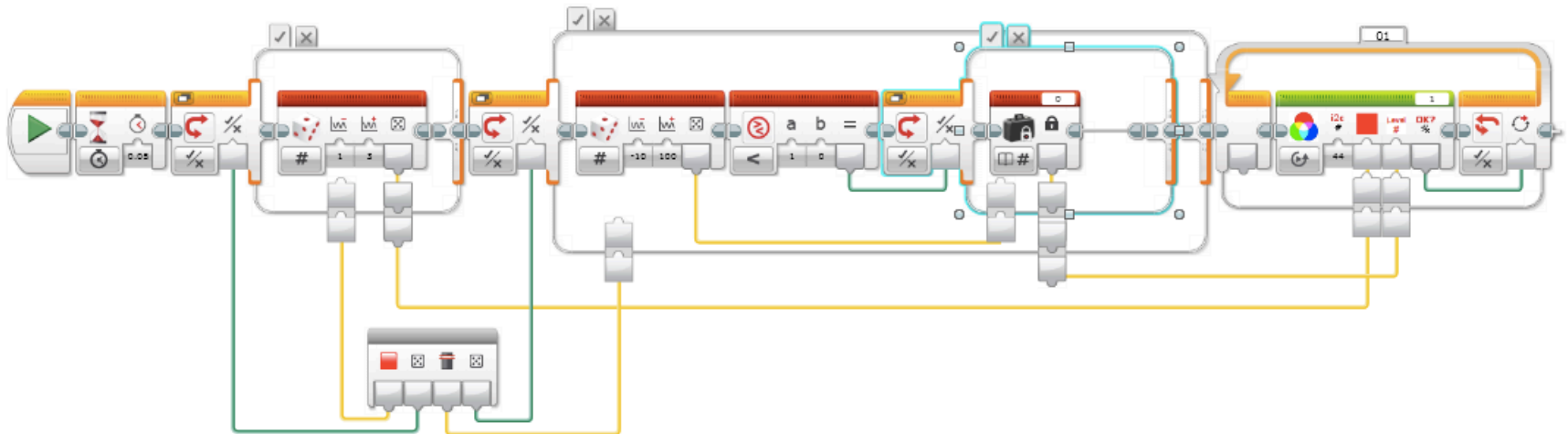
A loop at the end repeats the selection until it succeeds

MyBlock Continued



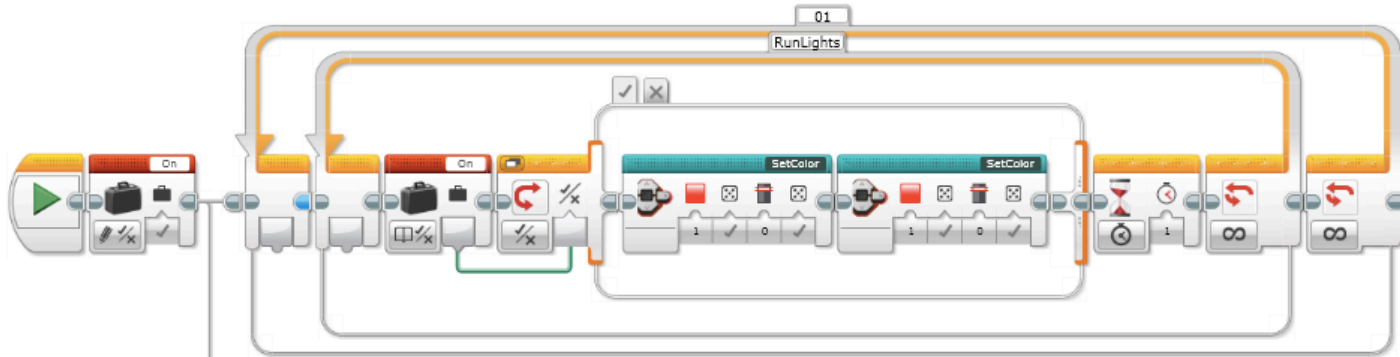
Inputs: User can request the choice of a random color and/or intensity. Random intensity range is set to 0-100 (because we preferred this range).

MyBlock Continued



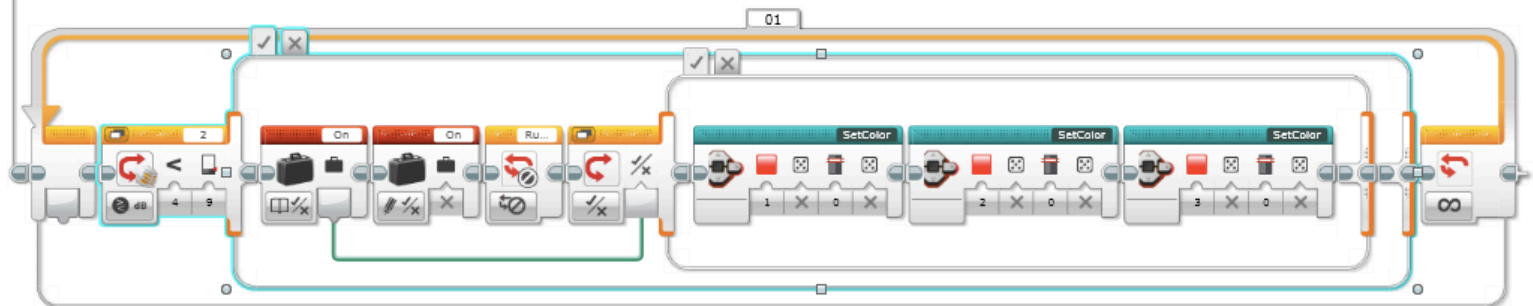
Inputs: The random intensity is set to 0 about 10% of the time for variety.

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



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