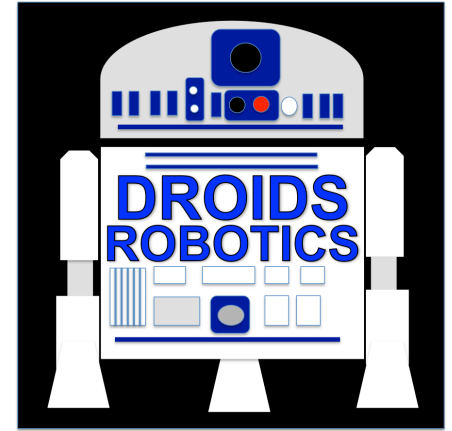


INTERMEDIATE EV3 PROGRAMMING LESSON



COLOR LINE FOLLOWER MY BLOCK WITH INPUTS

BY DROIDS ROBOTICS

WWW.EV3LESSONS.COM

PART 1: COLOR FOLLOWER WITH INPUTS....MOVES FOR CERTAIN NUMBER OF DEGREES

LESSON OVERVIEW

- Another team asked us how to create a line follower My Block that would allow you to take multiple inputs – power, degrees and color
- This requires you to use your EV3 Color Sensor in Color Mode
- You will not have to Calibrate your color sensor for this lesson
- You will have to know how to make a basic My Block and use data wires (We show you in the comments, but you can check our My Blocks lesson in the Advanced section)
- Follow along in the companion EV3 File. Always start at Stage 1
- **Note:** We use a simple line follower in this lesson. You can combine these techniques with any line follower.
- **Next steps:** Droids Robotics recommends that teams learn how to create a proportional line follower for light or a smooth line follower for color → check out our Advanced Lessons.

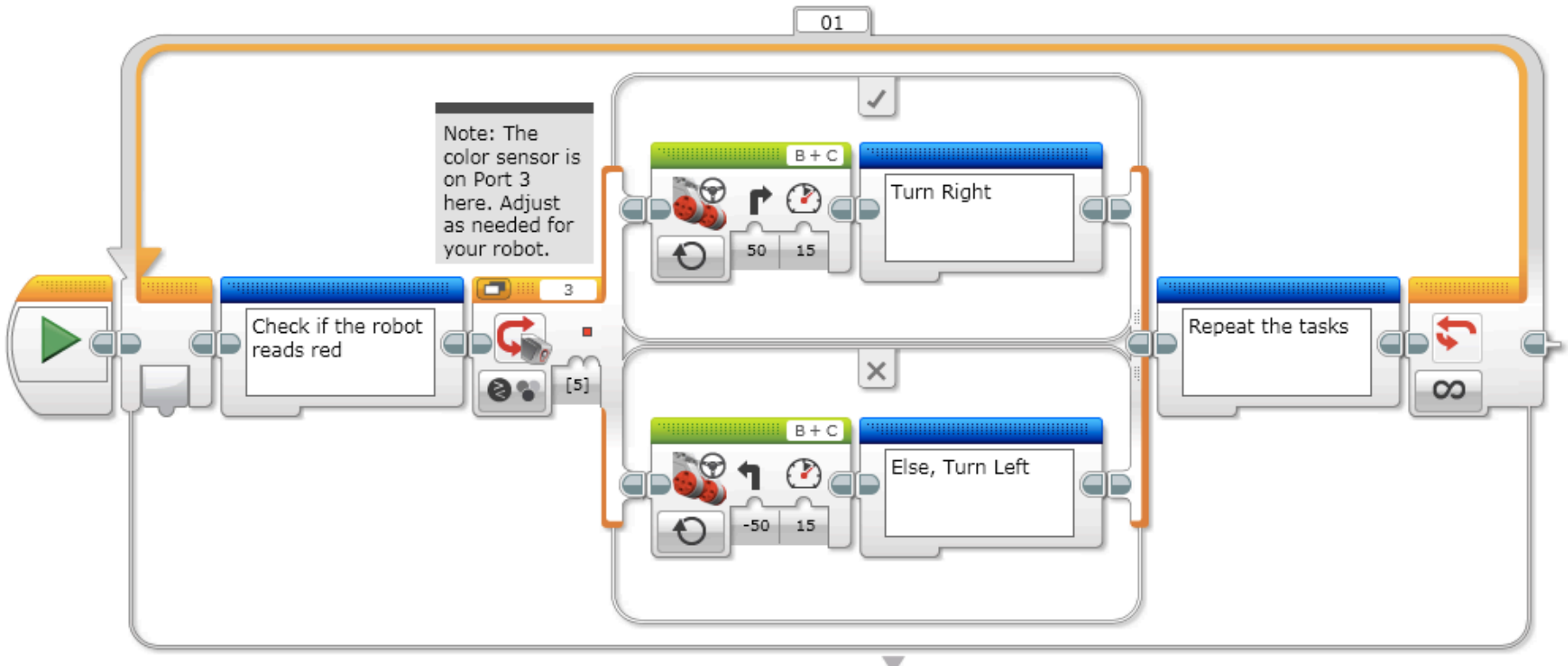
STAGE 1: SIMPLE COLOR LINE FOLLOWER

Goal: To create a Line Follower with Color as the input.

Step 1: Create a simple color line follower that follows the right side of the line.

Pseudocode:

If the robot reads red, turn right
If the robot sees any other color, turn left
Repeat these two tasks



STAGE 2: RESET & DEGREES

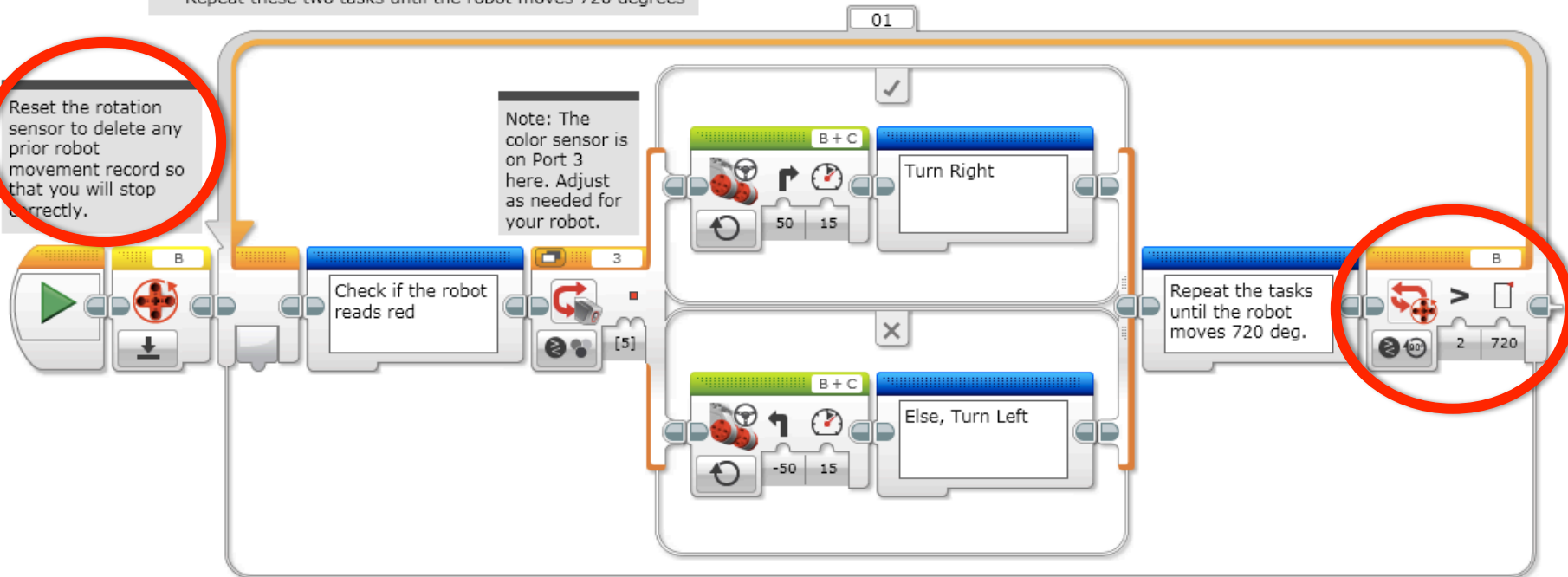
This program is the same as step 1 except it stops after 720 degrees (Which you can change to suit your needs).

Pseudocode:

- Reset the rotation sensor
- If the robot reads red, turn right
- If the robot sees any other color, turn left
- Repeat these two tasks until the robot moves 720 degrees

Reset the rotation sensor to delete any prior robot movement record so that you will stop correctly.

Note: The color sensor is on Port 3 here. Adjust as needed for your robot.



STAGE 3: ADDING INPUTS

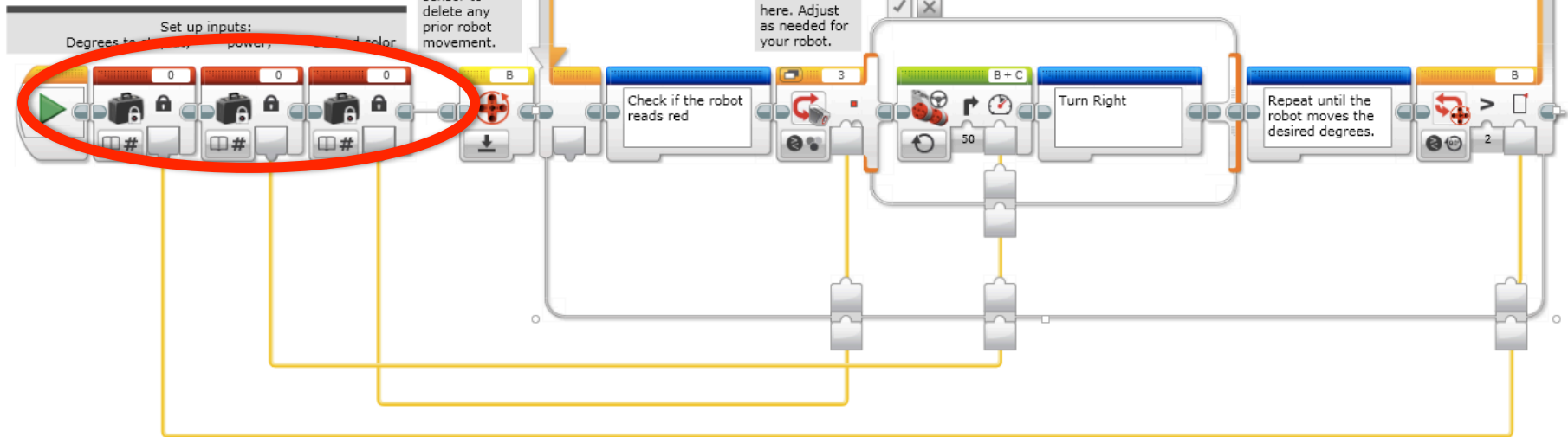
This program is the same as step 2 except it has added inputs.

Pseudocode:

Reset the rotation sensor
If the robot reads red, turn right
If the robot sees any other color, turn left
Repeat these two tasks until the robot moves desired degrees

Reset the rotation sensor to delete any prior robot movement.

Note: The color sensor is on Port 3 here. Adjust as needed for your robot.



STAGE 4: MY BLOCK

This program is the same as step 3, but is converted into a my block.
Process:

1. Highlight all the blocks except for the constants and start block
2. Click Tools-->My Block Builder
3. This menu will allow you to customize your My Block
4. Click on the last block tab (the torquoise one) to find your newly made block!

inputs:
Degrees to stop at; power; desired color



Color Key

0	- No Color
1	- Black
2	- Blue
3	- Green
4	- Yellow
5	- Red
6	- White
7	- Brown

Note: I picked 720 degrees, 15 power and 5 = Red. Notice that in the My Block, the green color icon in the third tab DOES NOT adjust when you pick a new color. Pick the correct number from the key.

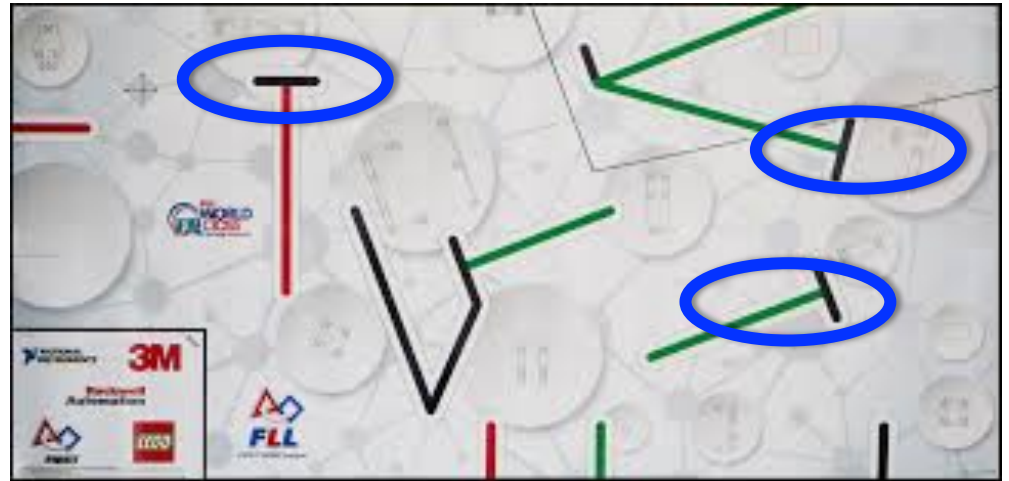
PART 2: COLOR FOLLOWER WITH INPUTS....MOVES UNTIL IT SEES BLACK

COLOR LINE FOLLOWER THAT ENDS ON A BLACK LINE

In previous lessons we taught a simple color line follower and one that stops after a certain amount of degrees

A team in Ohio requested help with writing a color line follower that would stop when it sees black.

This is very useful because you will notice that even when FLL Mats have colored lines on them, the “T intersections” are always black



Follow along in the EV3 Code Start at Step 1. By Step 2 you will have your code. Proceed to Steps 3 and 4 to make this code into a My Block with Inputs.

TIPS TO SUCCEED

- 1) Beginning Teams: You will need to know how to make a Simple Color Line Follower program
- 2) Intermediate and Advanced students should use the instructions and make a My Block with Inputs so you can reuse the code as needed.
- 3) Check which ports you have your color sensor connected to and adjust the code as needed
- 4) You may have to adjust the speed or direction to work for your robot. For example, our robot travel backwards for line following.
- 5) Make sure you place the robot on the side of the line that you are following. The most common mistake is placing the robot on the wrong side of the line to begin with.

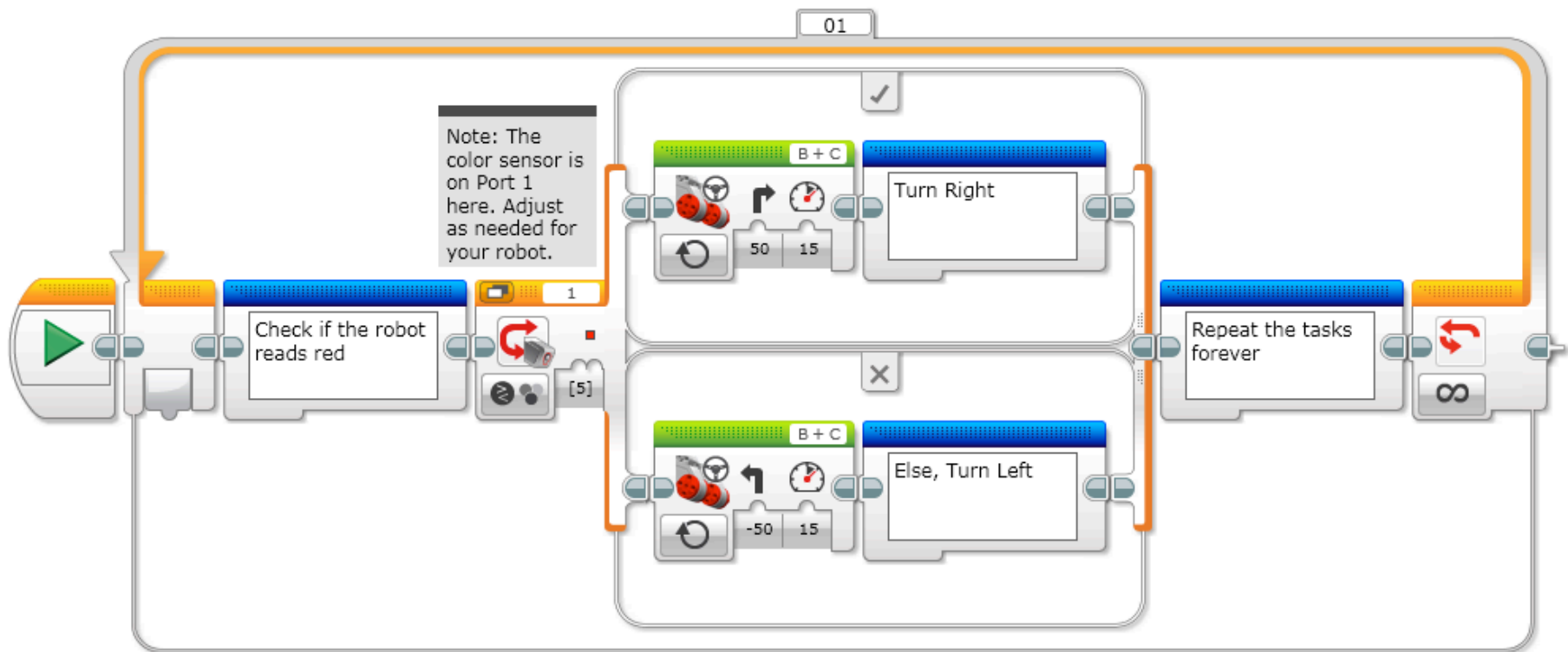
STEP 1: MAKE A SIMPLE LINE FOLLOWER

Final Goal: To create a Line Follower with Color as the input and stops on a black line.

Step 1: Create a simple color line follower that follows the right side of the line.

Pseudocode:

If the robot reads red, turn right
If the robot sees any other color, turn left
Repeat these two tasks



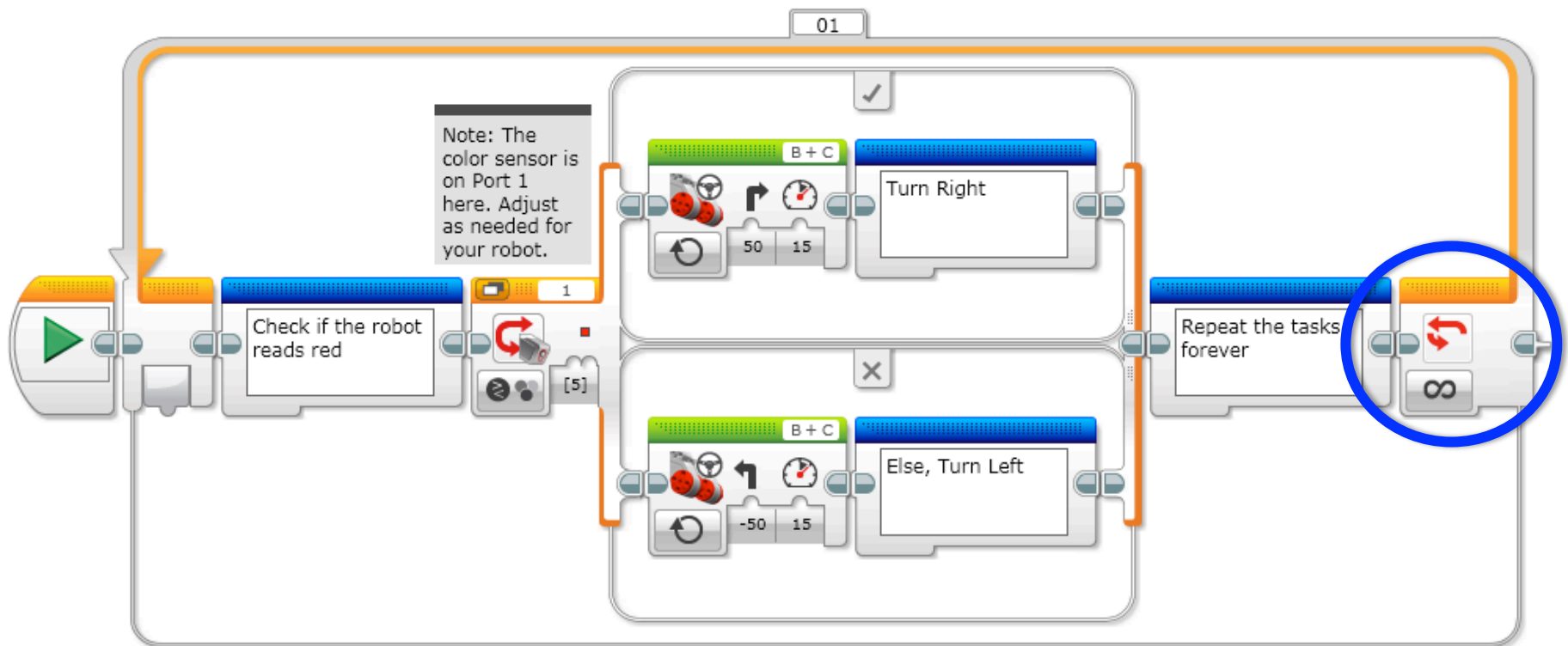
STEP 1: MAKE A SIMPLE LINE FOLLOWER

Final Goal: To create a Line Follower with Color as the input and stops on a black line.

Step 1: Create a simple color line follower that follows the right side of the line.

Pseudocode:

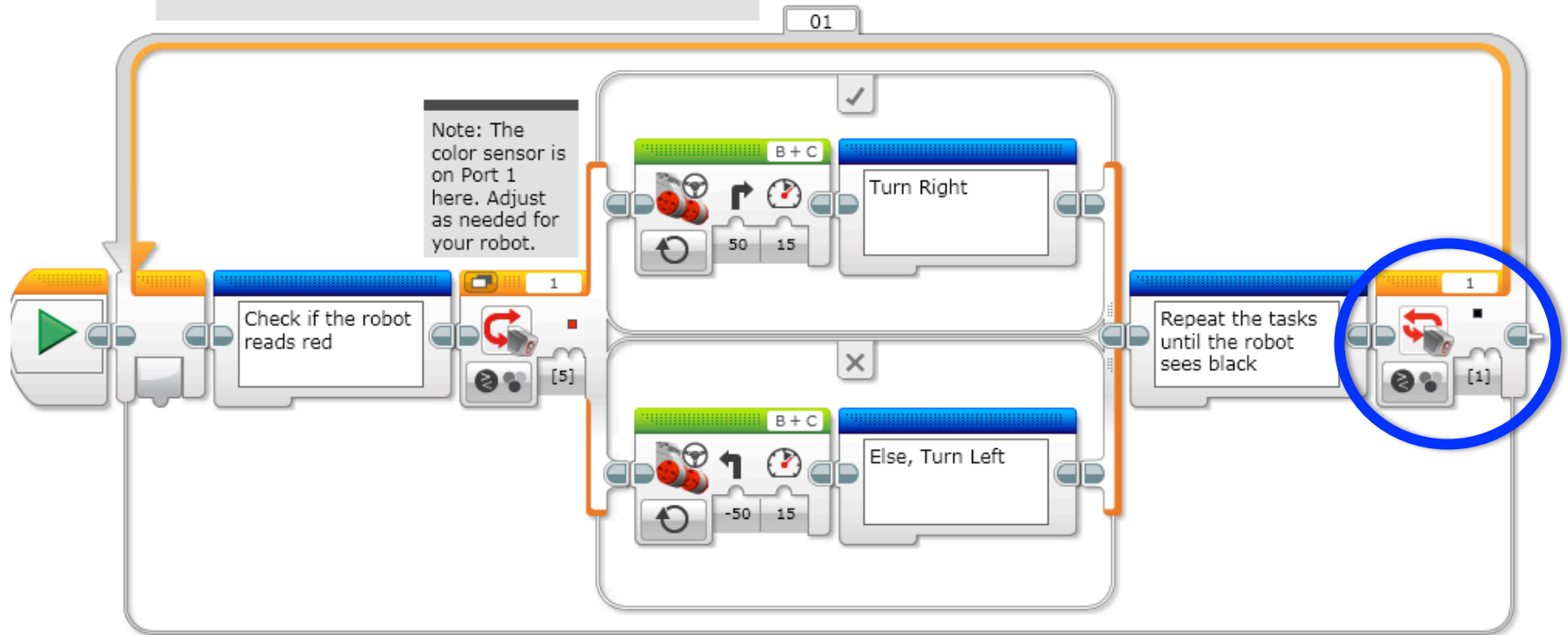
If the robot reads red, turn right
If the robot sees any other color, turn left
Repeat these two tasks



STEP 2: STOPS ON BLACK

This program is the same as step 1 except it stops after when the robot sees black (Which you can change to suit your needs).

Pseudocode:
If the robot reads red, turn right
If the robot sees any other color, turn left
Repeat these two tasks until the robot sees black

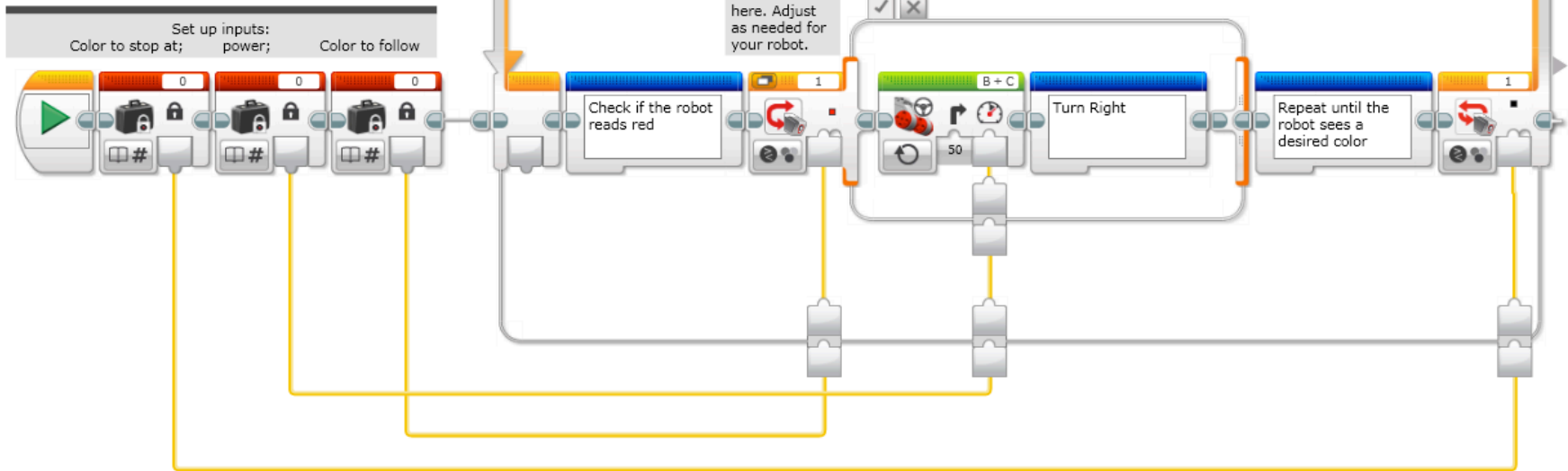


STEP 3: ADDING INPUTS

This program is the same as step 2 except it has added inputs.

Pseudocode:

```
If the robot reads red, turn right
If the robot sees any other color, turn left
Repeat these two tasks until the robot reads the desired color
to follow
End line following when it sees black
```



STEP 4: THE MYBLOCK

This program is the same as step 3, but is converted into a my block.

Process:

1. Highlight all the blocks except for the constants and start block
2. Click Tools-->My Block Builder
3. This menu will allow you to customize your My Block
4. Click on the last block tab (the torquoise one) to find your newly made block!

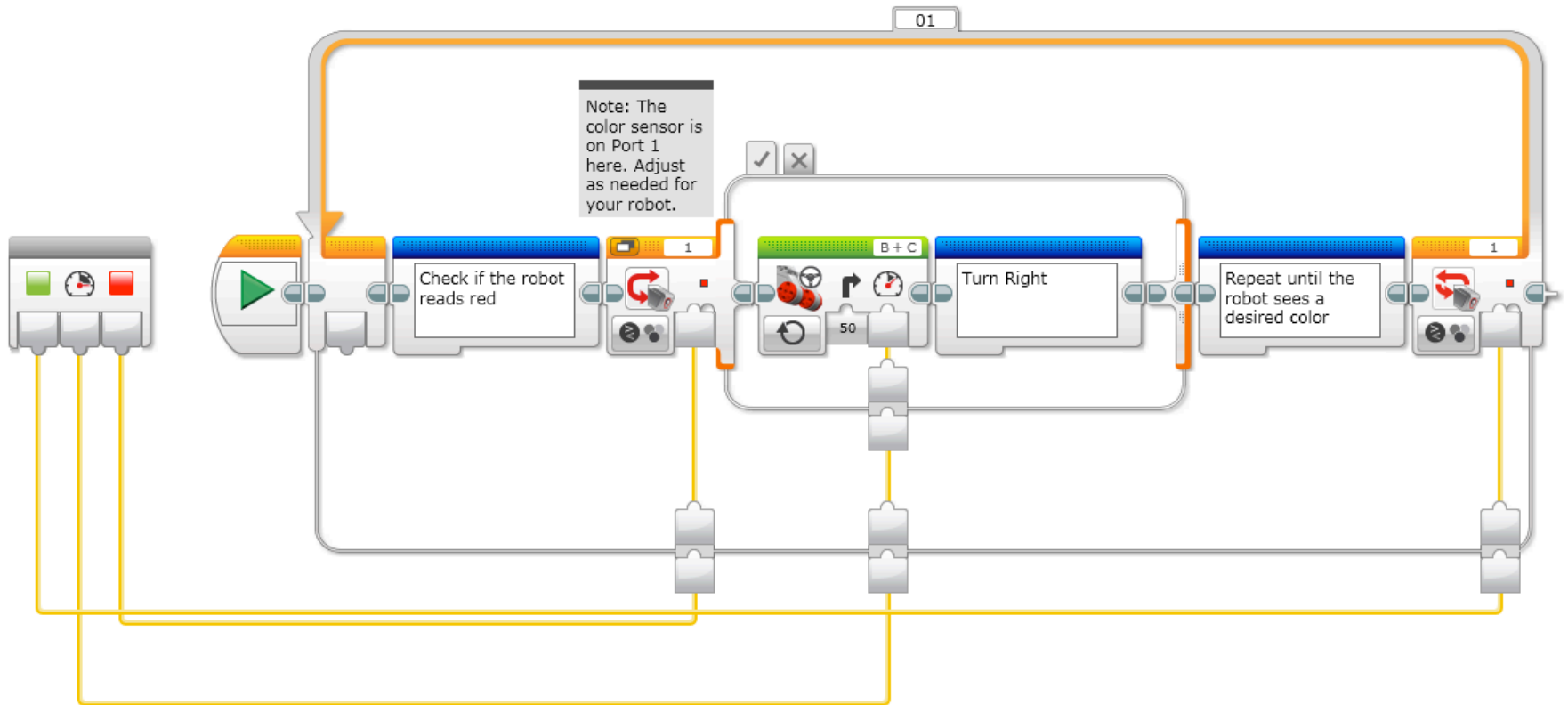
inputs:
color to stop at; power; desired color to follow



Color Key
0 - No Color
1 - Black
2 - Blue
3 - Green
4 - Yellow
5 - Red
6 - White
7 - Brown

Note: I picked 1 = black, 15 power and 5 = Red. Notice that in the My Block, the green and red color icon in the first and third tabs DO NOT adjust when you pick a new color. Pick the correct number from the key.

INSIDE THE MY BLOCK



CREDITS

- This lesson was made by Sanjay and Arvind Seshan from FLL Team Not the Droids You are Looking For.
- This material is free to use and distribute. Please credit Droids Robotics if you use it.
- Please send us an email letting us know if you liked the material, how you used it, and if you have any corrections or suggestions for improvement.
 - team@droidsrobotics.org
- More lessons at: www.ev3lessons.com

