

INTERMEDIATE PROGRAMMING LESSON



LOGIC OPERATIONS & DECISION MAKING

By Sanjay and Arvind Seshan



Lesson Objectives

Learn what the Logic Block does

Learn how to use the Logic Block

Prerequisites: Data Wires, Sensor Blocks

Logic Operations Block

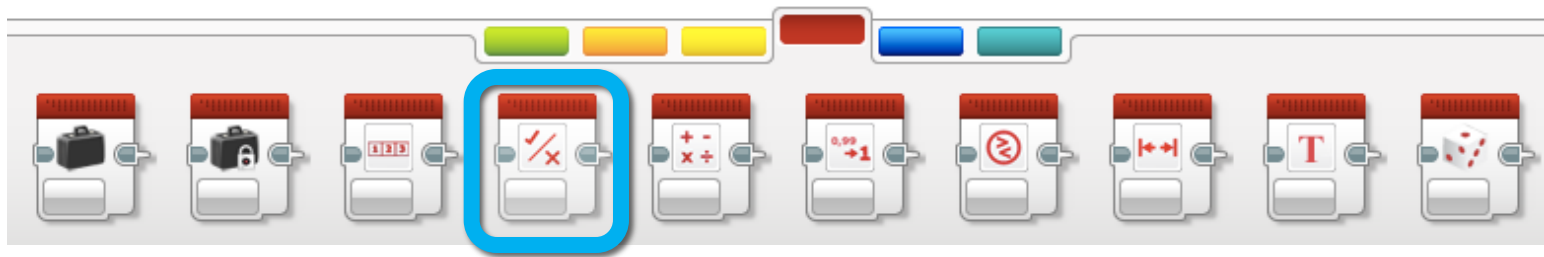
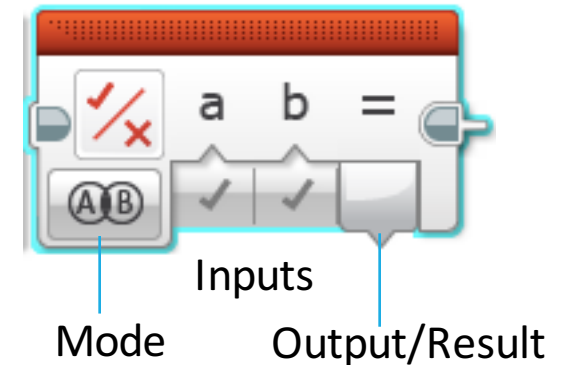


The Logic Block does a Logic operation on its inputs, and outputs the result





A Logic Block takes inputs that are True or False, and produces a True or False output

Logic values can be used as inputs into loop exists and switch conditions.

It is found in the Red Programming Pallet tab



Different Modes in the Logic Block

| Icon | Mode | Inputs | Output/Result |
|---|------|--------|--|
|  | AND | A, B | <ul style="list-style-type: none">• True if both A and B are both true, otherwise the result is False |
|  | OR | A, B | <ul style="list-style-type: none">• True if either A or B (or both) is/are True. The result is False if both A and B are False |
|  | XOR | A, B | <ul style="list-style-type: none">• True only if one (and exactly one) of A and B is True• The result is False if both A and B are True• The result is False if both A and B are False |
|  | NOT | A | <ul style="list-style-type: none">• Outputs the opposite of what you input.• The result is True if A is False• The result is False if A is True |

The icons are Venn Diagrams. The dark shaded areas identify what needs to happen for the block to output True.

Logic Blocks in Three Easy Steps

CHALLENGE: Make your robot drive forward until EITHER the Touch Sensor is pressed or the Color Sensor detects black.

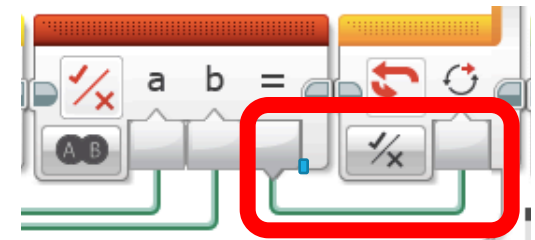
STEP 1: Turn the motors on

STEP 2: Add the Logic and Sensor Blocks

- A. Use a Logic Block in the OR mode
- B. Add the inputs: Take a color sensor and a touch sensor blocks and wire them into the Logic Block as inputs

STEP 3: Add a Loop and loop exit condition:

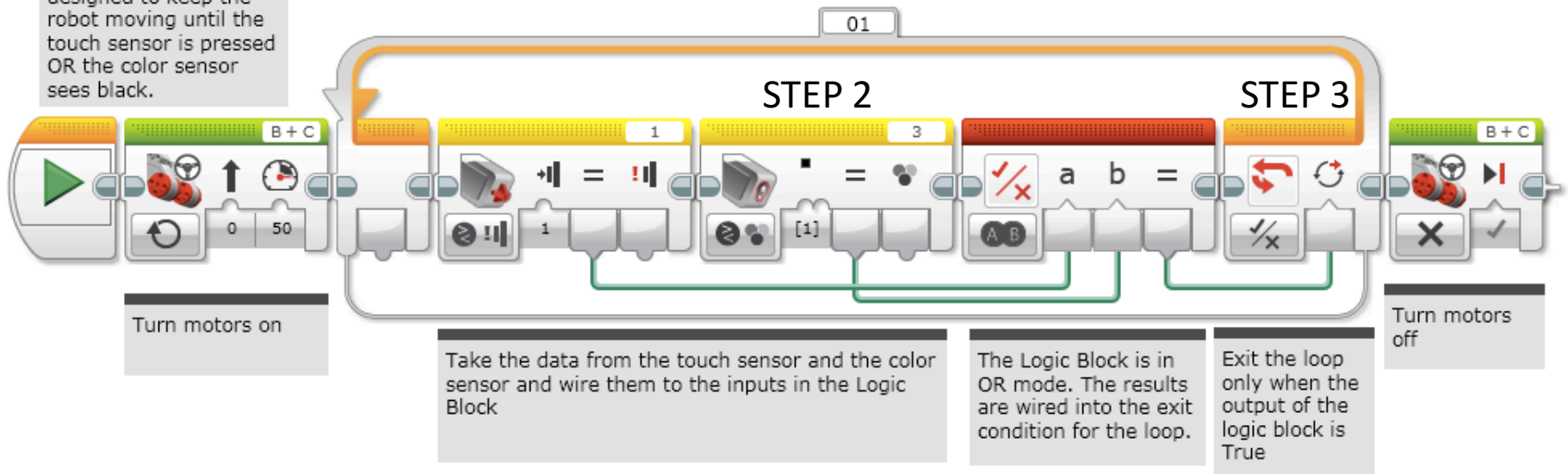
- Place the Sensor and Logic Blocks in a loop
- For the exit condition of the loop, select logic. Wire the result of the Logic Block into the exit condition
- If the result of STEP 2 is True, you should exit the loop and stop the robot



Challenge Solution

STEP 1

This program is designed to keep the robot moving until the touch sensor is pressed OR the color sensor sees black.



Credits

- This tutorial was written by Sanjay and Arvind Seshan
- More lessons at www.ev3lessons.com



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