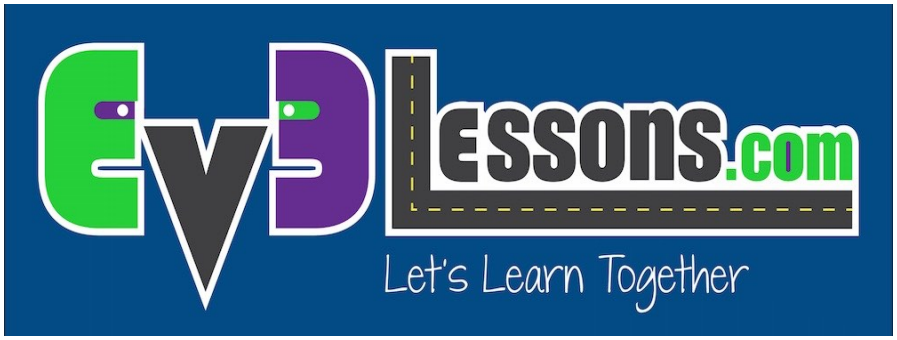
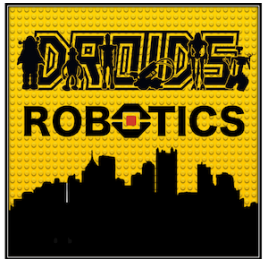
BEGINNER EV3 PROGRAMMING LESSON



Topics Covered:
Ultrasonic Sensor



By: Droids Robotics

LESSON OBJECTIVES

1. Learn about the Ultrasonic Sensor
2. Learn how to use Wait Until Ultrasonic Block
3. Learn the difference between the Wait Until Ultrasonic Block and the Ultrasonic Block

WHAT IS A SENSOR?

- **A sensor lets an EV3 program measure and collect data about is surroundings**
- **The EV3 sensors include:**
  - Color – measures color and darkness
  - Gyro – measures rotation of robot
  - Ultrasonic – measures distance to nearby surfaces
  - Touch – measures contact with surface
  - Infrared – measures IR remote's signals

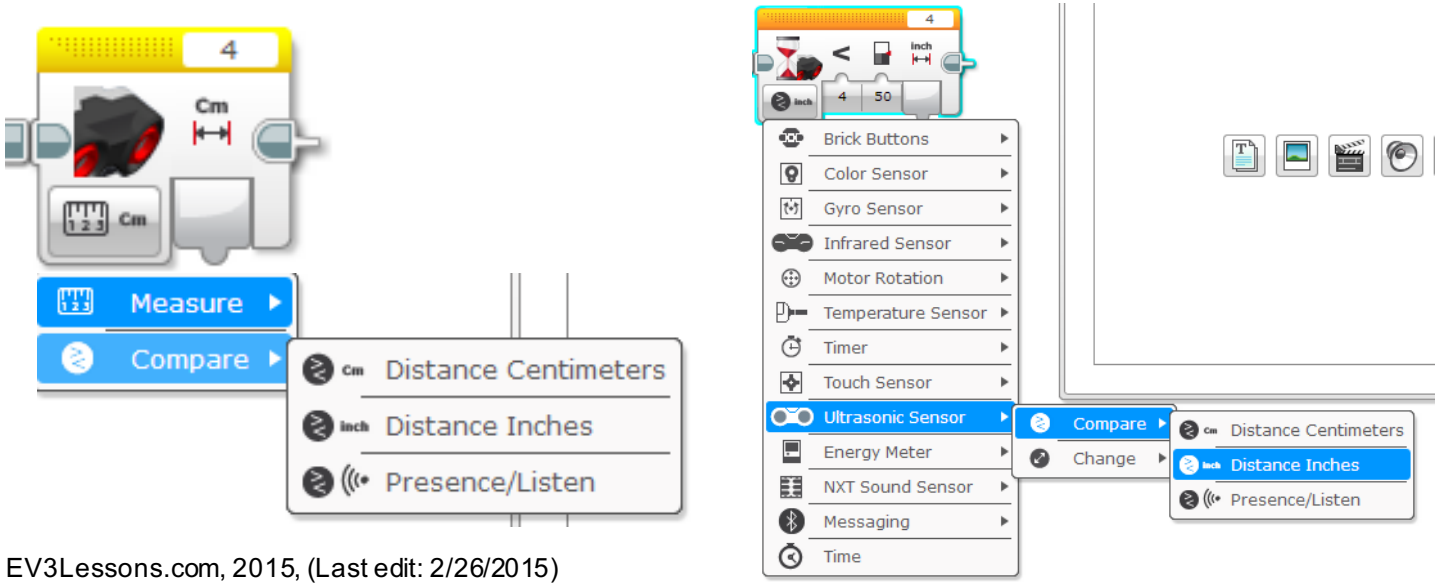
Our lessons will cover the 4 sensors in green.

Image from: http://www.ucalgary.ca/IOSTEM/files/IOSTEM/media_crop/44/public/sensors.jpg

ULTRASONIC

- An ultrasonic sensor measures distance.
- You use it when you need to make sure you are a certain distance away from a target.
- The distance can be measured in inches or centimeters.
- To read the ultrasonic sensor, you use the Ultrasonic Block. To use the ultrasonic to do an action until a distance, you use “Wait Until”

Read Ultrasonic vs. Wait for Ultrasonic



ULTRASONIC CHALLENGE 1

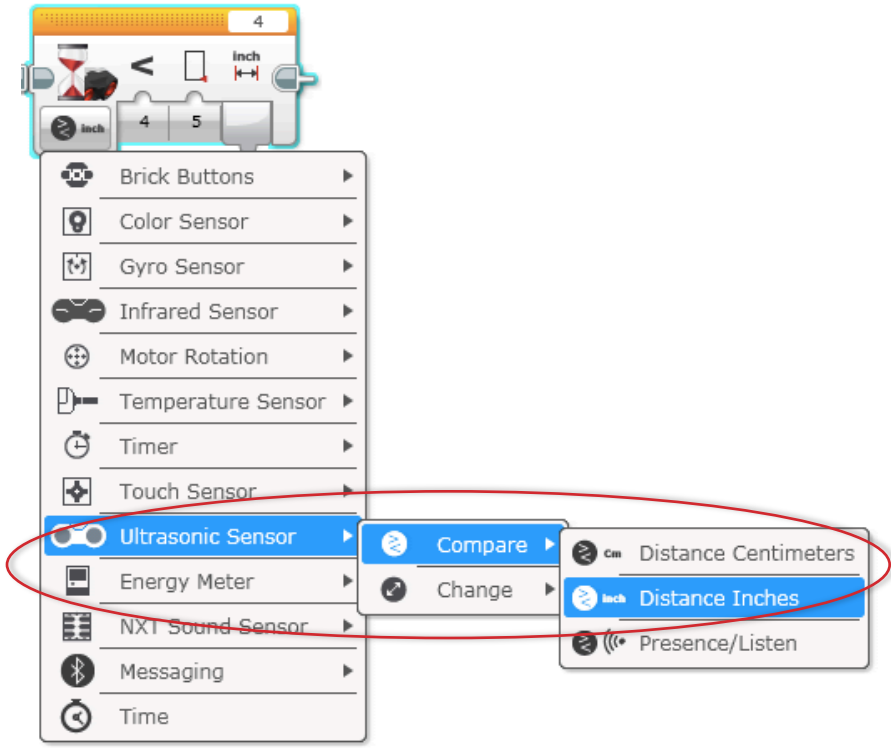
Challenge: Make the robot move until it is 5 inches away from the wall.

Step 1: Make a new program

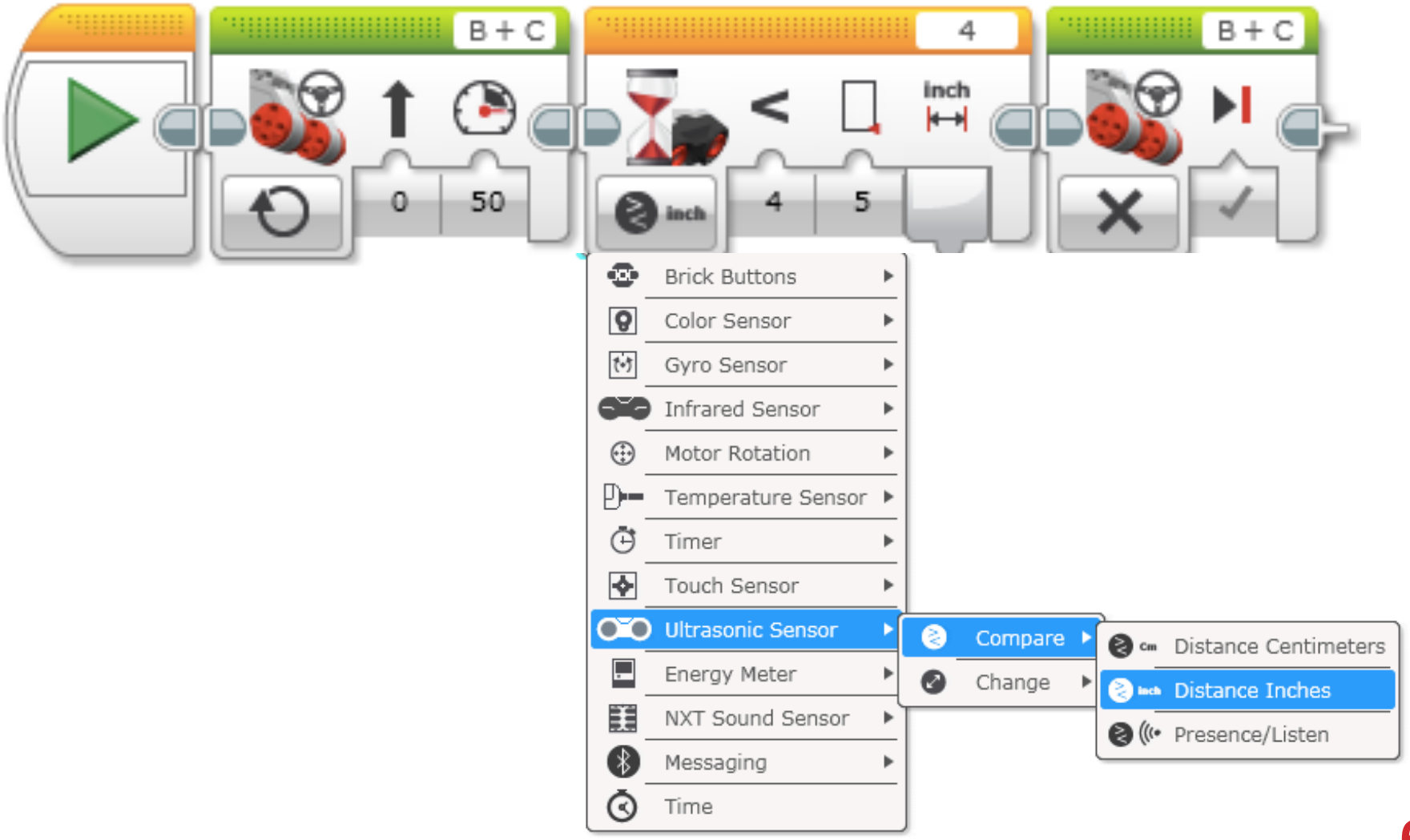
Step 2: Set move to "on"

Step 3: Set wait block to use the Ultrasonic

Step 4: Set move block to "off"



CHALLENGE 1 SOLUTION



CHALLENGE 2: DOG FOLLOWER

If the robot is closer than 5 inches away from your hand move backward, otherwise move forward.

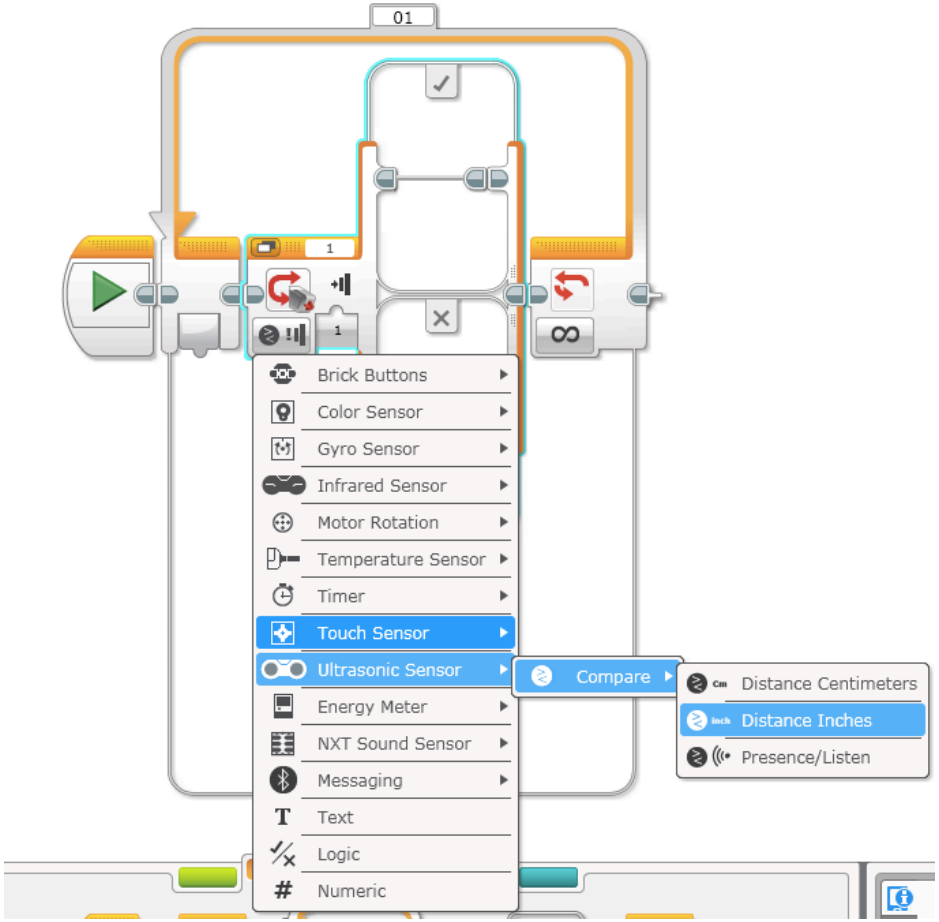
Step 1: Drag a loop from the orange tab

Step 2: Drag switch inside loop

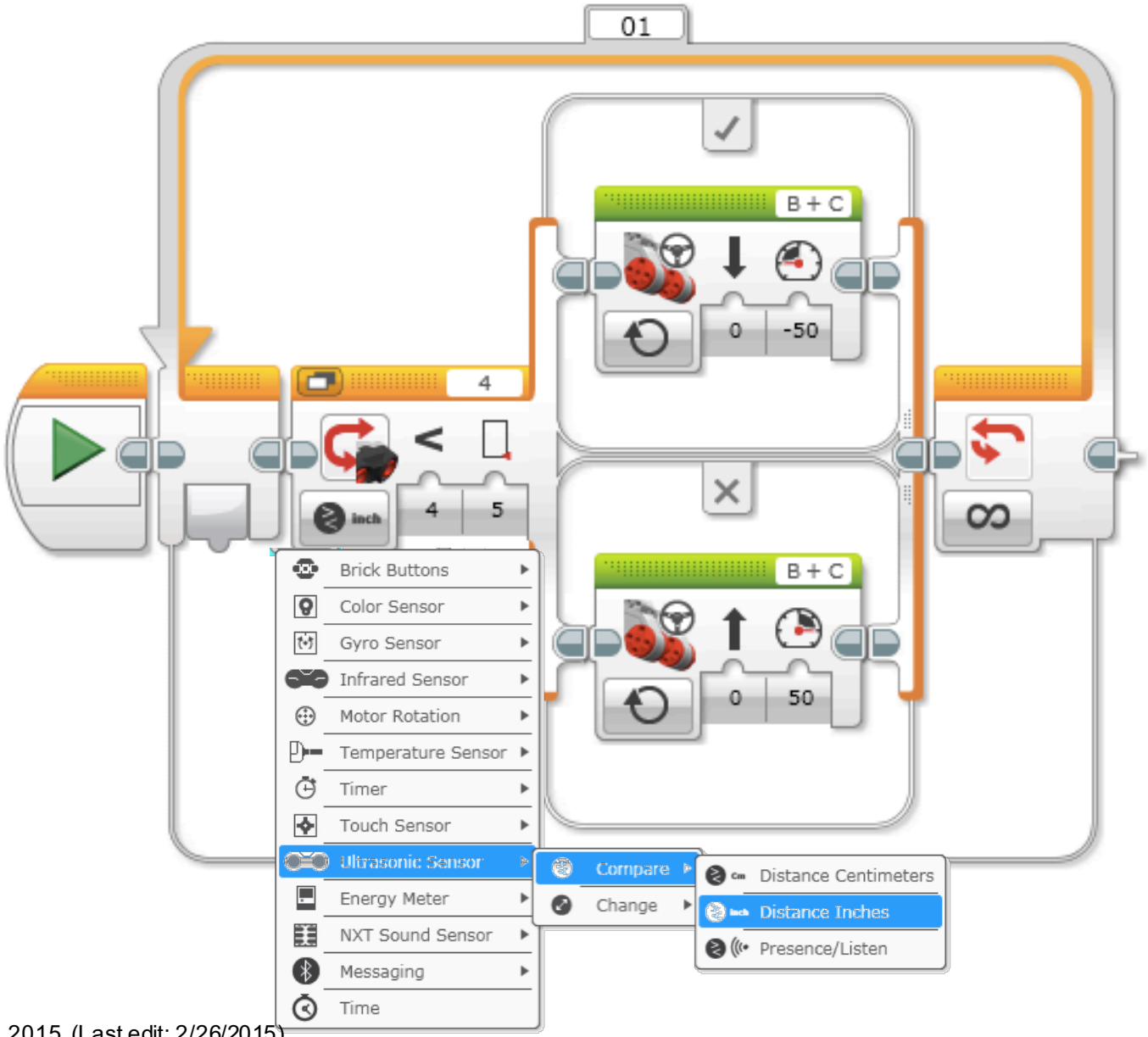
Step 3: Set switch to Ultrasonic

Step 4: Set move steering block to ON and place in TRUE

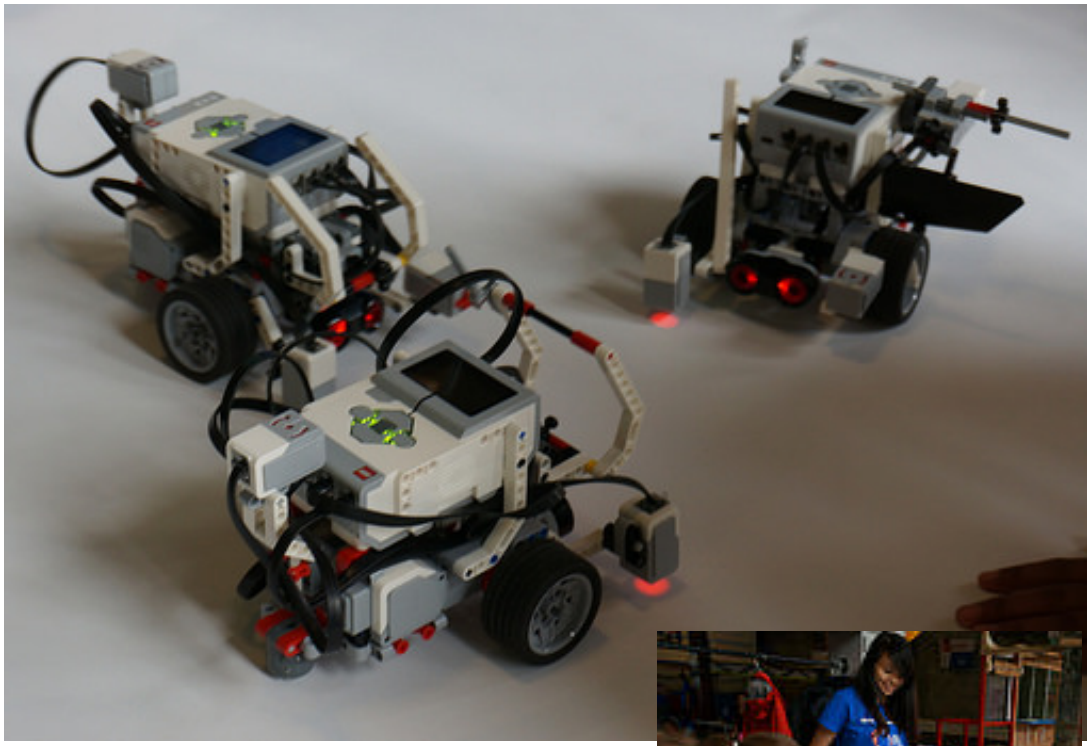
Step 4: Set move steering block to OFF and place in FALSE



CHALLENGE 2 SOLUTION

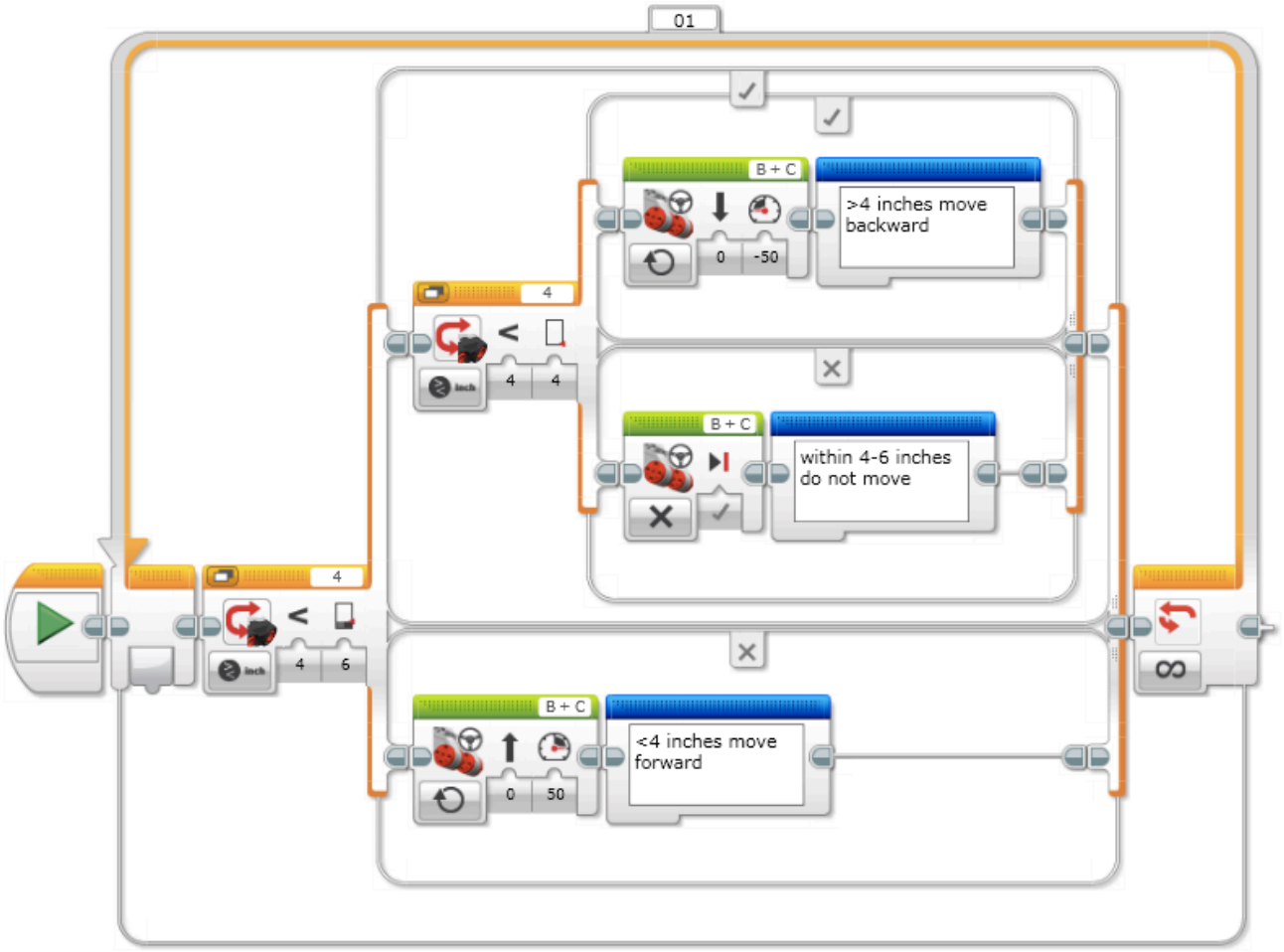


ROBOTS CAN FOLLOW YOU & EVEN DANCE WITH THIS CODE!



BETTER DOG FOLLOWER:

The previous dog follower kept the robot moving always. This version lets the "dog" rest if it is between 4-6 inches.



CREDITS

- **This tutorial was created by Sanjay Seshan and Arvind Seshan from Droids Robotics.**
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- **Author's Email: team@droidsrobotics.org**