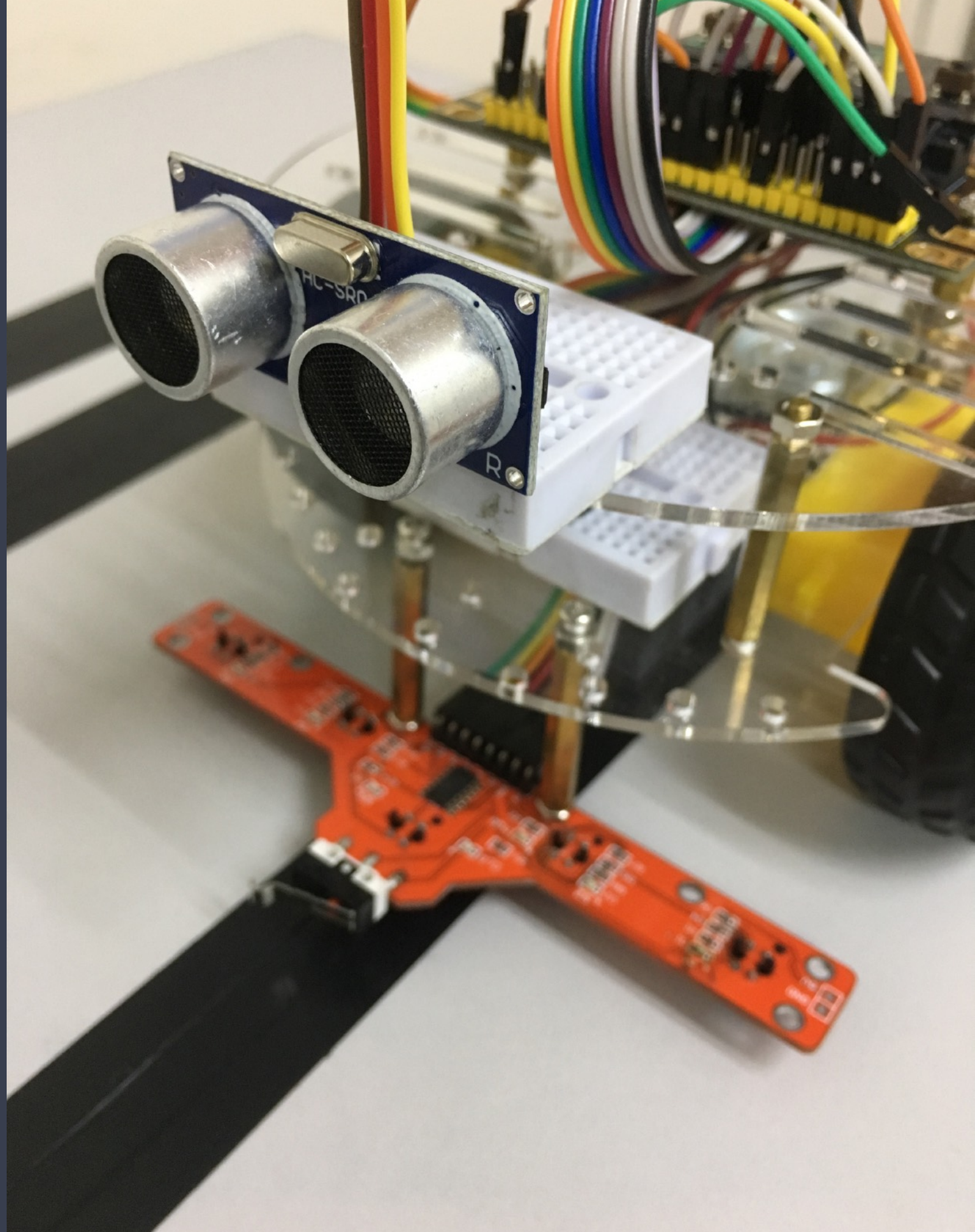
MakerHouse : Empowering Makers

MICRO:BIT

IR SENSOR

“THE EYE”

The building blocks of line following robots using micro:bit



Things used in this project:

HARDWARE

- micro:bit
- Edge breakout for micro:bit, I/O expansion
- Ultrasonic sensor HC-SR04
- Smart robot car chassis kit with DC motor set
- Jumper wires

SOFTWARE

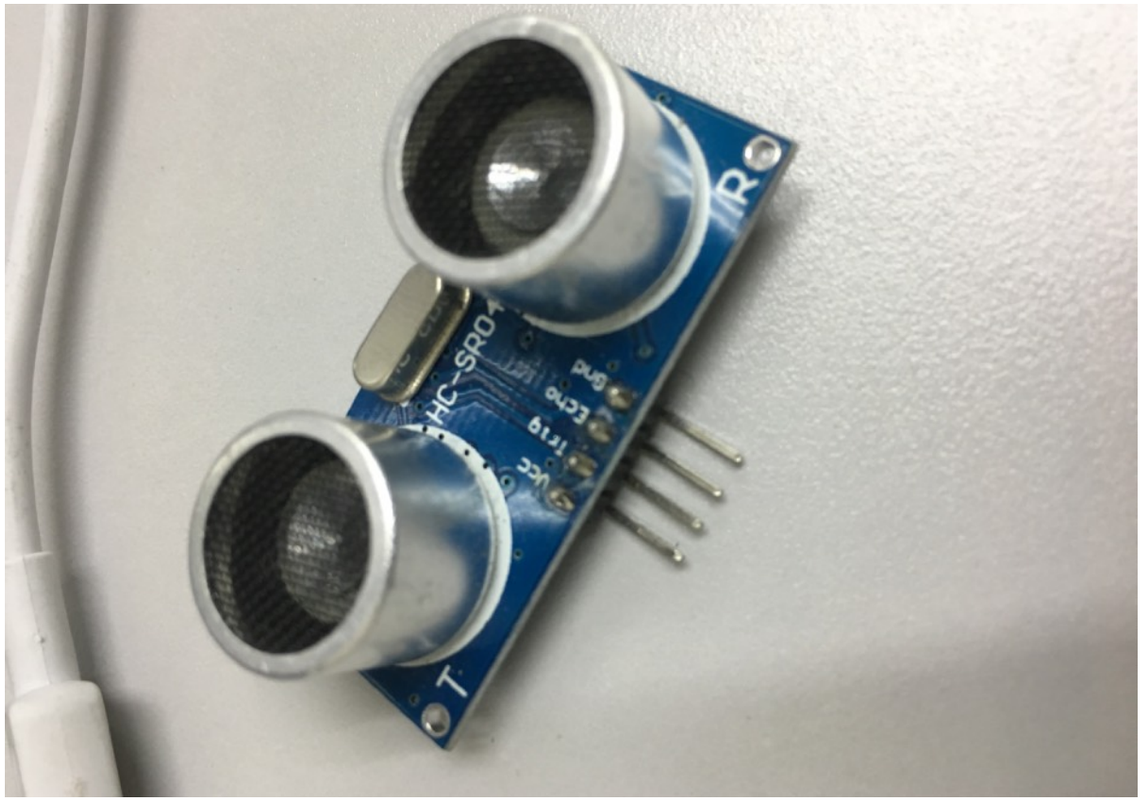
- Microsoft MakeCode

OBJECTIVES

We will be adding a new features on our micro:bit based line follower robot – an "eye". We will be learned about the ultrasonic sensor – the basic and how to use it with micro:bit programmed in Microsoft MakeCode.

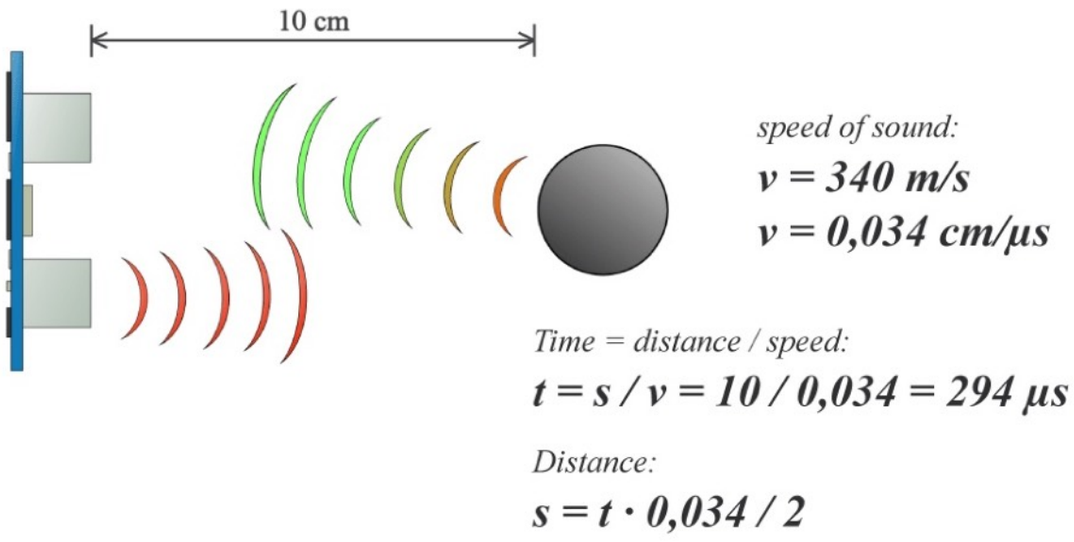
Once completed the experiment (project), students will:

1. Understand about the ultrasonic sensor
2. How to use ultrasonic sensor connect it with micro:bit and program it with MakeCode to determine the distance.



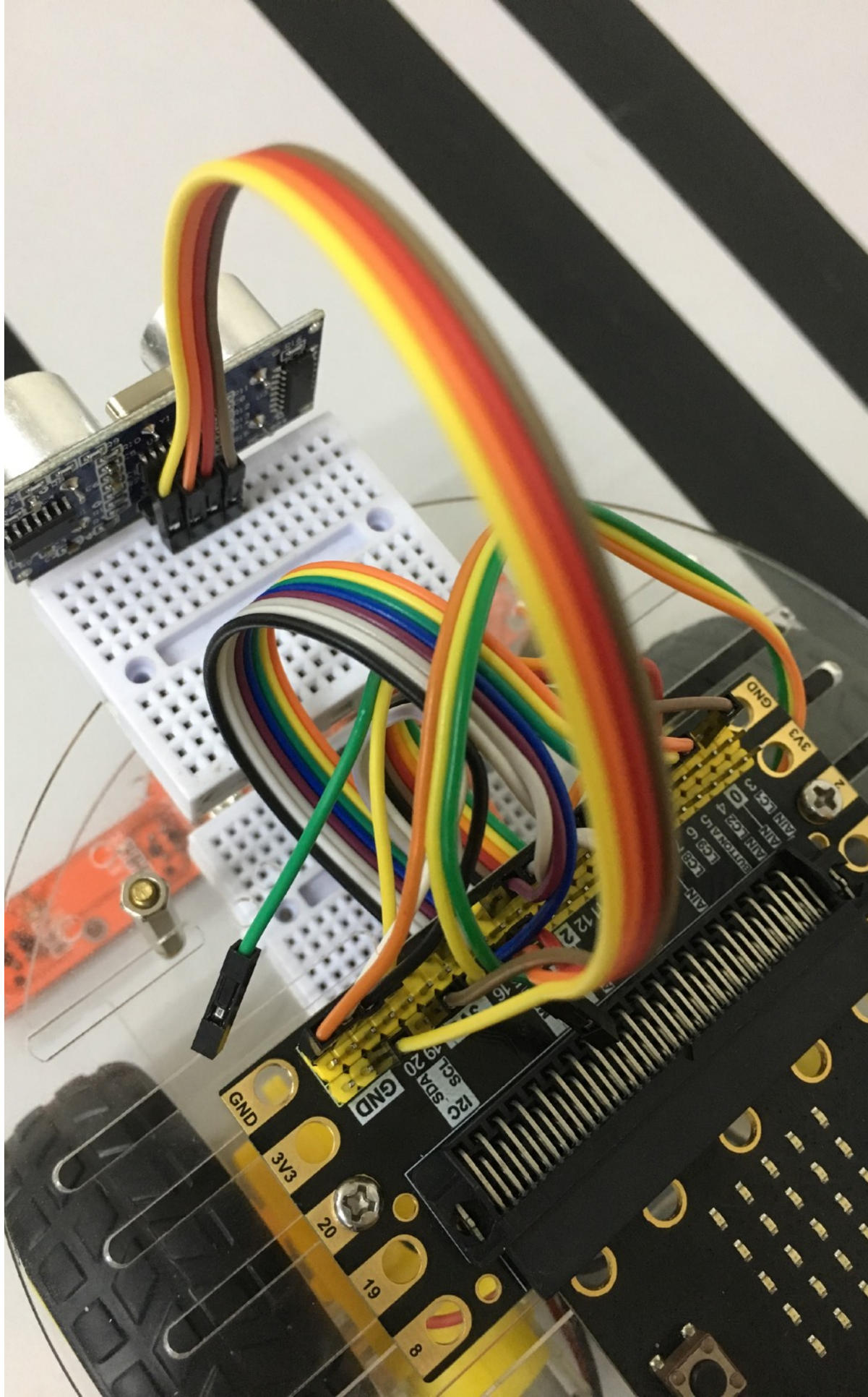
CONCEPTS OF ULTRASONIC SENSOR

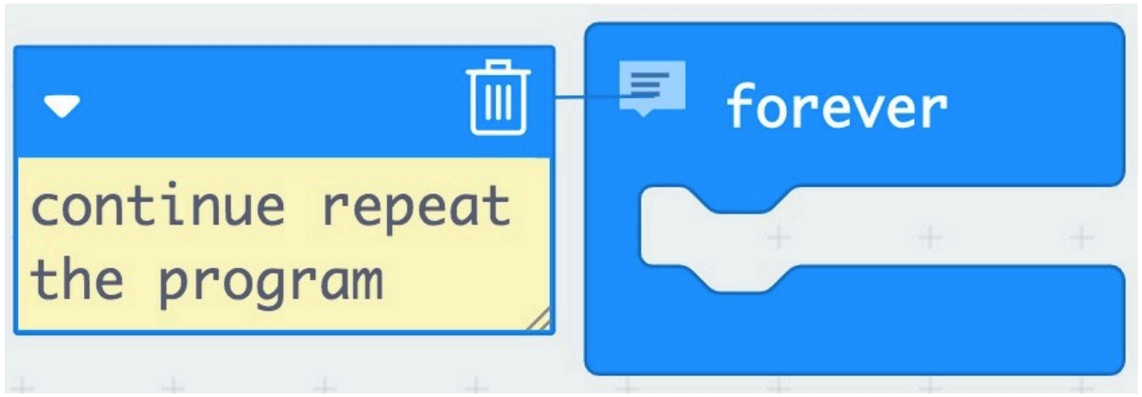
It emits an ultrasound at 40 000 Hz which travels through the air and if there is an object or obstacle on its path It will bounce back to the module. Considering the travel time and the speed of the sound you can calculate the distance.

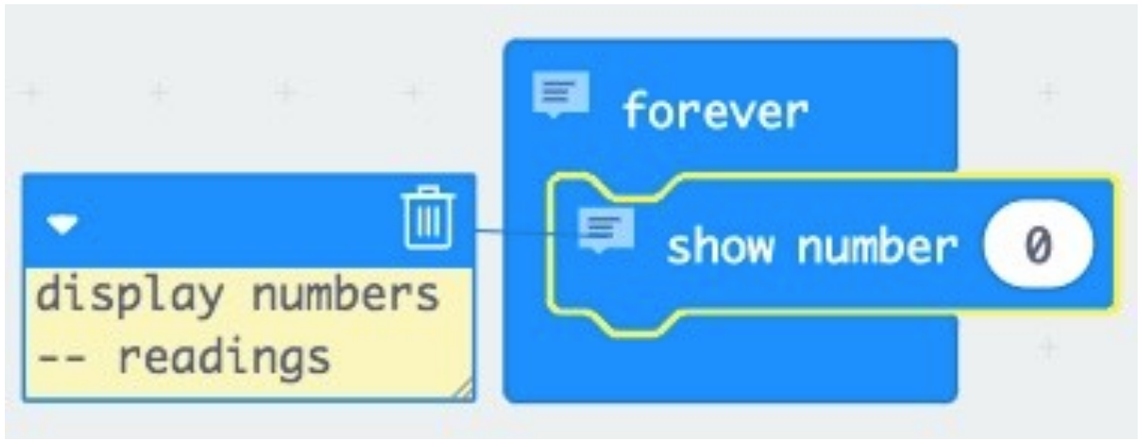


WIRINGS (CONNECTIONS)

Sensor Pin	Micro:bit Pin
VCC	3V3
Trig	15
Echo	16
GND	GND







FLASHING PROGRAM

BASICS

Step 0: Connect the micro:bit to the pc, open the Microsoft **MakeCode** Software. Click **new program** and rename it – **Ultrasonic Sensor**.

Step 1: Start with the **forever** block – allows the code repeated forever.

Step 2: Under **Basic**, select **show number**.

Step 3: Select **Extensions**. Then find for **sonar** expansion, add it into the working project.

Step 4: Configure the pins numbering.

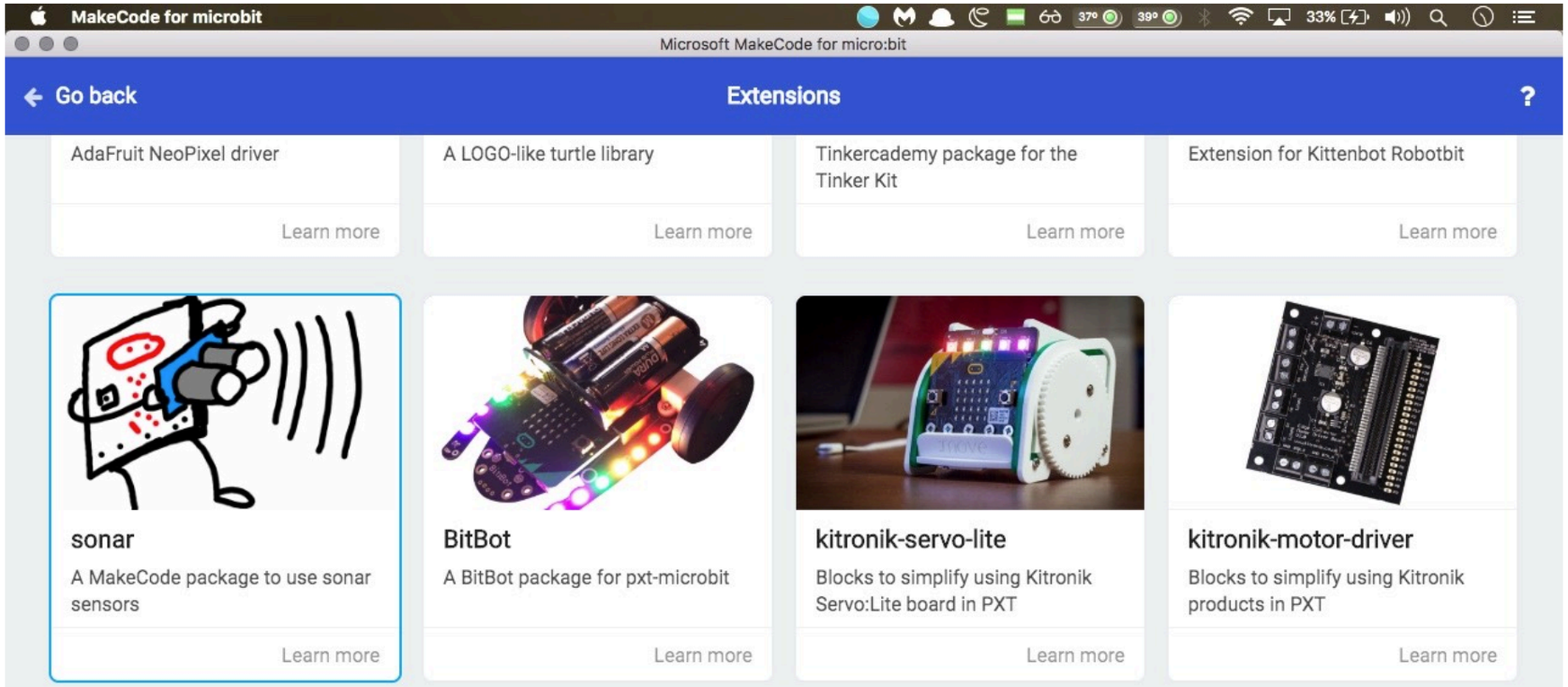
Step 5: Download!

Step 5: Test the ultrasonic sensor. Observe the behaviour – the distance reading.

CHALLENGE

Combining the project – line following with obstacle avoidance.

EXPANSIONS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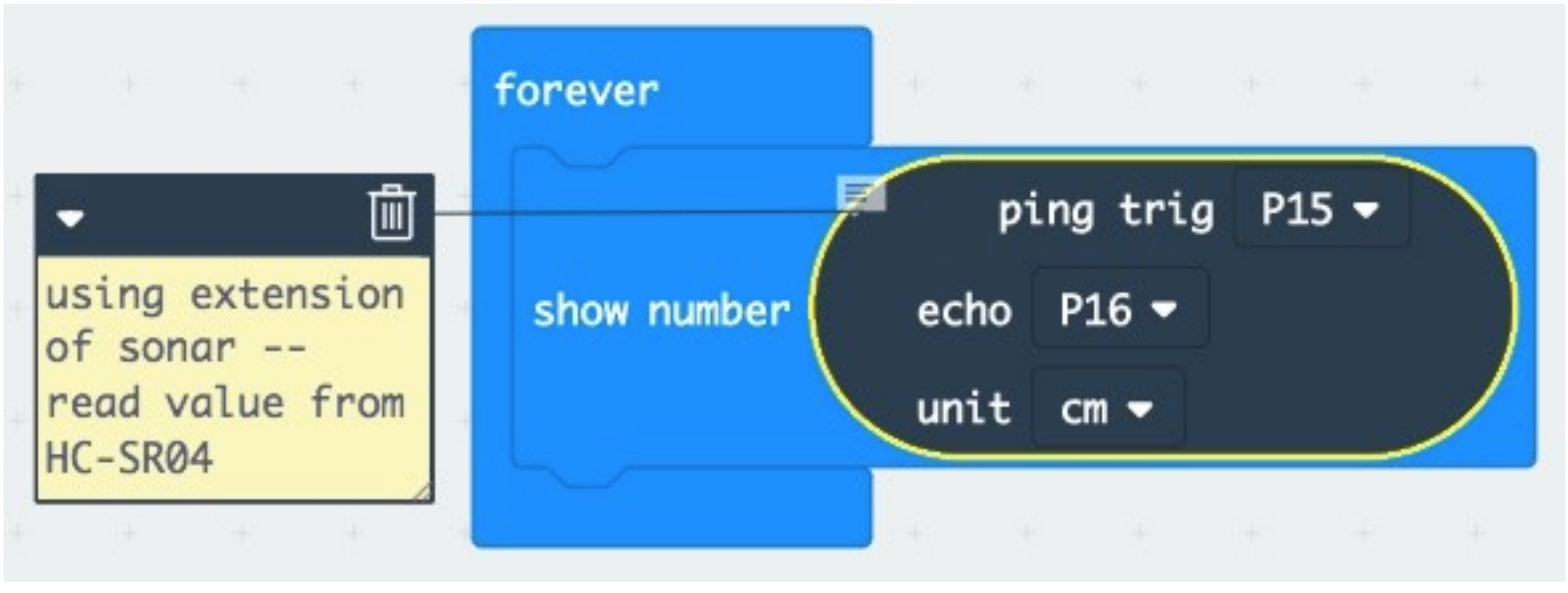
forever
show number
ping trig P15
echo P16
unit cm
using extension of sonar -- read value from HC-SR04