STEM - Smart Robot v2 - Altronics Z6454

Lesson 8.3 - Ultrasonic & Infrared Obstacle Avoidance Demo

Simulation of this lesson can be found at https://makecode.microbit.org/34159-52615-23509-28623

Scan QR code for Lesson 8.3 Simulation

Note: ***(Robot construction must be completed before this Step)***

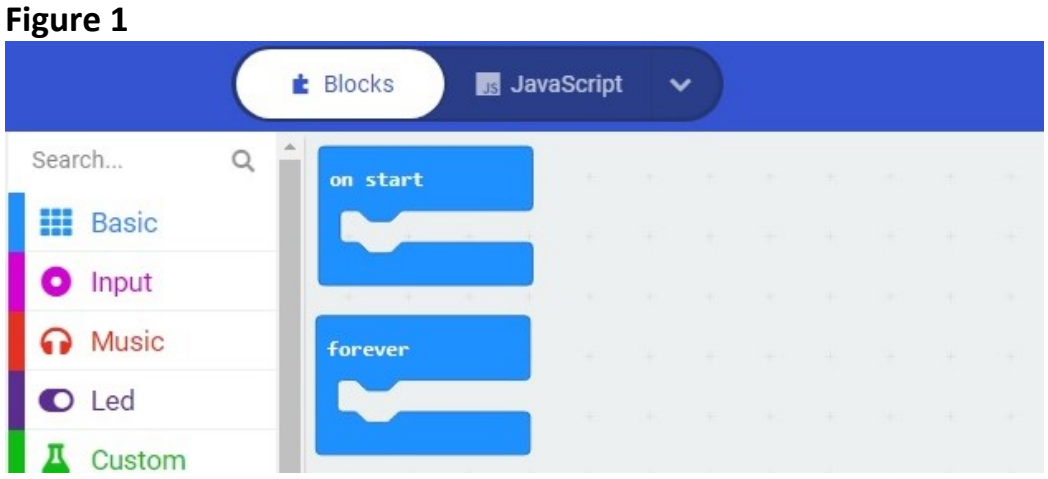
Goal for this lesson
Learn to use the Ultrasonic & Infrared sensors as an Obstacle avoidance system to control the Robot and produce a visual display on the Neopixel LED.

Hardware Required
PC or Tablet
1 x micro USB cable
1 x Smart Robot with micro:bit & battery installed

Step 1 *As per Figure 1*

a. Goto URL https://makecode.microbit.org/#
b. Create **"+New Project"** & give it a name
c. Press **Gear** symbol – top right
d. Press Extensions
e. Add repository found using link below.
https://github.com/AltronicsAUKits/Z6454-Robot-Kit-v2_KS0426
f. On start up both **"on start"** & **"forever"** will be in your work space, move **"forever"** block below **"on start"** block.

Figure 1

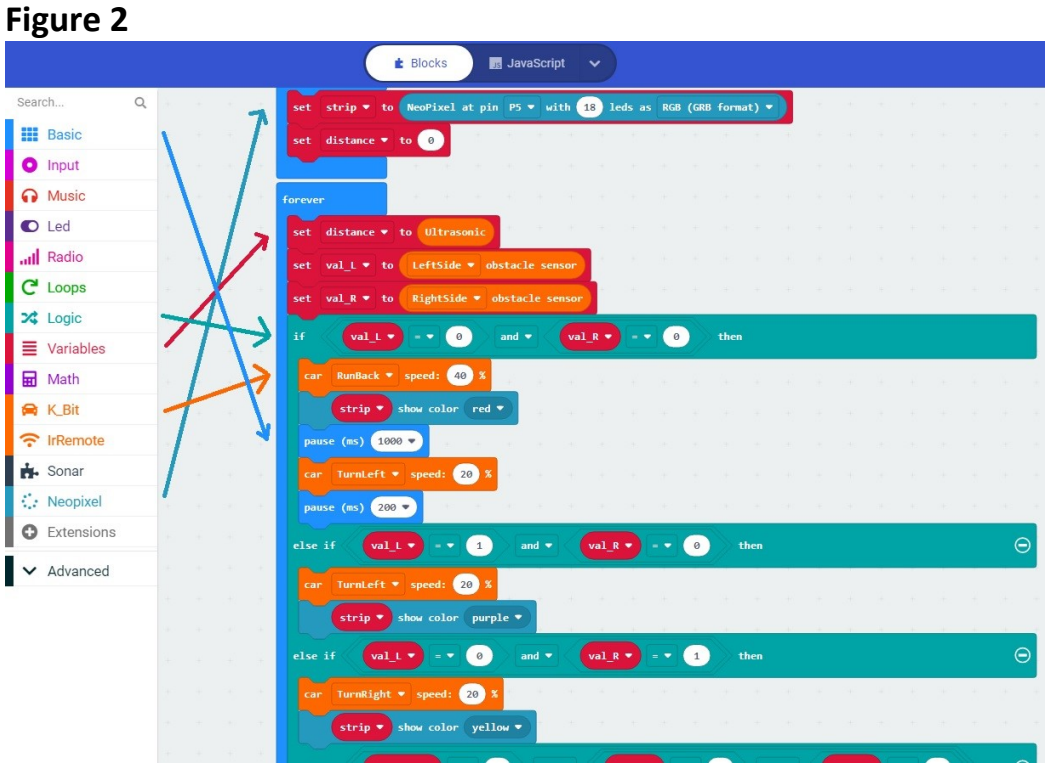


Step 2 *as per Figure 2*

Moving forward we will only highlight the locations for the required modules to produce the desired code.

a. We will be utilising the **"Basic"** Tab
b. We will be utilising the **"Logic"** Tab
c. We will be utilising the **"Variables"** Tab
d. We will be utilising the **"K_Bit"** Tab
e. We will be utilising the **"Neopixel"** Tab
f. Download the code to the micro:bit

Figure 2



Expected Result!

a. Insert the micro:bit into the robot & Power on.
b. If the robot detects object on both obstacle sensors it will move backwards and the Neopixel will illuminate Red. Then turn left slightly.
c. If the right obstacle sensor detects an object the robot will turn left slightly and the Neopixel will illuminate Purple.
d. If the left obstacle sensor detects an object the robot will turn right and the Neopixel will illuminate Yellow.
e. If the Ultrasonic sensor detects an obstacle at a distance =< 10 and there are no obstacles near the sensors the robot will turn right slightly. and the Neopixel will illuminate Blue.
f. If the Ultrasonic sensor detects no object at a distance > 10 and there are no obstacles the robot will drive forward and the Neopixel will illuminate Green.
g. If anyone the variables goes out of threshold the robot will return to it logic to find its next step.

Example Ultrasonic & Infrared Obstacle Avoidance Demo can be found at
https://makecode.microbit.org/34159-52615-23509-28623

STEM Smart Robot can be purchase from Altronics.
https://www.altronics.com.au/p/z6454-stem-microbit-mini-smart-robot-car-v2.0/