Arduino Simple Obstacle Avoidance

Time required: 30 minutes

Please read all the directions carefully before beginning the assignment.

1. Comment your code as shown in the tutorials and other code examples.
2. Follow all directions carefully and accurately.
3. Think of the directions as minimum requirements.

Understanding

Demonstrate understanding of:

ultrasonic sensor, if statements

Requirements

- Avoid obstacles by backing up, turning right, then continue moving.
- Include **Movement.h**.

Tutorial Assignment

1. Start the Arduino IDE. Save the sketch as **SimpleObstacleAvoidance**.
2. Complete and test the program as pictured with the requirements listed.
3. Comment your code.

D-SimpleObstacleAvoidance | Movement.h

```ino
/**
   @file    SimpleObstacleAvoidance.ino
   @author  William A Loring
   @version V1.0.0
   Revised: 10/21/2022  Created: 01/04/2017
   @Description: Simple Obstacle Avoidance
   If there is an obstacle, backup, turn right 90 and keep going
*/
#include <MeMCore.h>
#include "Movement.h"
// Setup mBot hardware
MeIR ir; // Setup IR Remote
MeBuzzer buzzer;  // Setup the buzzer
MeUltrasonicSensor ultrasonic(PORT_3);  // Setup the ultrasonic sensor
MeRGBLed led(0, 30);  // Setup the led's
const int OBSTACLE_DISTANCE = 8;  // Constant to set Distance to obstacle

void setup() {
  led.setpin(13); // Set the pin for the led
  ir.begin();     // Begin listening for the ir remote
}

void loop() {
  if (ir.keyPressed(IR_BUTTON_UP)) {
    avoidObstacle();
  }
}

void avoidObstacle() {
  while (true) {
    int sensorState;        // Store ultrasonic sensor reading
    led.setColor(0, 60, 0); //Set LED to green
    led.show();
    forward();
    // sensorState = ultrasonic.distanceCm(); // Read ultrasonic sensor in cm
    sensorState = ultrasonic.distanceInch();  // Read ultrasonic sensor in inches
    // If obstacle within OBSTACLE_DISTANCE distance, back up and turn right
    if (sensorState < OBSTACLE_DISTANCE) {
      led.setColor(60, 0, 0); //Set LED to red
      led.show();
      reverseInches(6);
      rightTurnDegrees(90);
    }
  }
}
```

Assignment Submission

- **All students** → Attach finished programs to the assignment in Blackboard.

- **In class assignment submission** → Demonstrate in person.
- **Online submission** → A link to a YouTube video recording showing the assignment placed in the submission area in BlackBoard.