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

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.

Requirements

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

Assignment Submission

1. All students: Zip up the sketch folder. Attach the zip file to the assignment in Blackboard.
2. The assignment is demonstrated in class.
3. Online students: A link to a YouTube video recording showing your robot going through its motions is placed in the submission area in BlackBoard.

```
/**
   @file    SimpleObstacleAvoidance.ino
   @author  William A Loring
   @version V1.0.0
   Revised: 10/06/2018  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
int sensorState;      // Store ultrasonic sensor reading
const int OBSTACLE_DISTANCE = 10;  // 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
  // If a remote button is pressed
  uint32_t value; // Declare unsigned 32 bit integer to store remote code
  do {
    if (ir.decode()) {   // If a remote button is pressed
      value = ir.value;  // Read the value from the remote
      value = value >> 16 & 0xff;
    }
  } while (value != IR_BUTTON_UP); // loop until ir up button is pressed
}

void loop() {
  avoidObstacle();
}

void avoidObstacle() {
  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);
  }
}
```