Arduino Smart Obstacle Avoidance

Time required: 60 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:

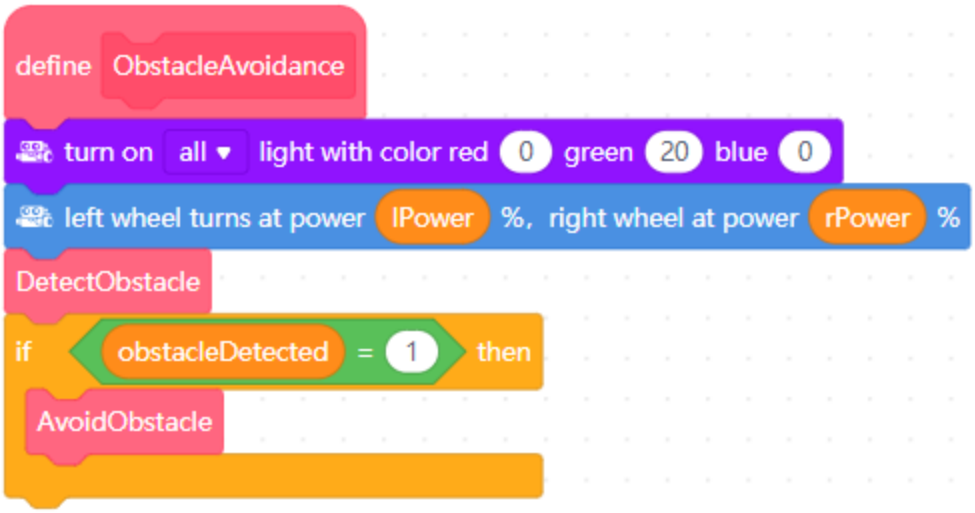
ultrasonic sensor

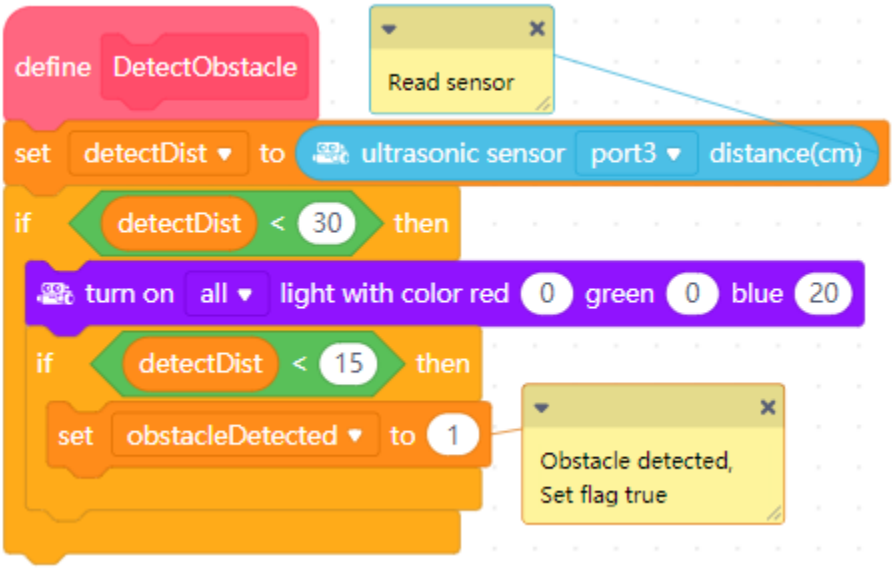
Requirements

- Open the **SimpleObstacleAvoidance** sketch and save it as **SmartObstacleAvoidance**.
- Use the shape of the mBlock version of this program to guide your coding.
- Avoid obstacles by looking left, then right, then turning in the direction with the longest distance.
- Use the following obstacle detection functions from the mBlock Obstacle Avoidance with Smart Turns as examples.
    - obstacleAvoidance
    - detectObstacle
    - avoidObstacle
    - lookLeft
    - lookRight
- Create a **boolean** variable **isObstacleDetected** to track whether there is an obstacle or not. Use **isObstacleDetected** = true or **isObstacleDetected** = false

```
bool isObstacleDetected = false;
```

- Include **Movement.h**


define ObstacleAvoidance
turn on all light with color red 0 green 20 blue 0
left wheel turns at power lPower %, right wheel at power rPower %
DetectObstacle
if obstacleDetected = 1 then
AvoidObstacle


define DetectObstacle
Read sensor
set detectDist to ultrasonic sensor port3 distance(cm)
if detectDist < 30 then
turn on all light with color red 0 green 0 blue 20
if detectDist < 15 then
set obstacleDetected to 1
Obstacle detected,
Set flag true

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.