# Smart Obstacle Avoidance

Time required: 60 minutes

By combining 90 degree turns and ultrasonic sensor readings, your robot can determine which way to go when it senses an obstacle. This program uses more blocks (functions) and uses a boolean flag to track object detection.

A boolean variable is either true or false. mBlock doesn't have boolean variables, we use a 0 for false or 1 for true.

A flag keeps track of the state of the mBot, it allows the mBot to "remember" something for later use. This program will remember whether an obstacle has been detected or not.

## Tutorial Assignment

1. Start mBlock. Open **Calibrate Distance and Square**, and Save the program as **Smart Obstacle Avoidance**.
2. Complete and test the program as pictured with the requirements listed.

## Requirements

- When it detects an obstacle: turn right, take a sensor reading, turn left, take a sensor reading. Turn the robot in the direction that has the longest distance.
- Use the accurate turn and movement programs created earlier to make turns and movement more accurate.
- Test the obstacle avoidance with your foot.

## Challenge

- Setup a maze with available objects, see if your robot can navigate through the maze.
- When the robot moves forward, if there is an obstacle ahead (e.g. 50 cm away), the robot will be alerted and turn on an alarm light and/or short sound.
- As an optional challenge: As the obstacle gets closer, the alarm and light frequency will gradually accelerate until the robot turns away.

## Assignment Submission

- All students attach the finished program to the assignment in Blackboard.
- Each assignment can be demonstrated in class.
- For online students, a link to a YouTube video recording showing the assignment can be placed in the submission area in BlackBoard.