

mBot Default Program Part 2: Obstacle Avoidance

Time required: 120 minutes

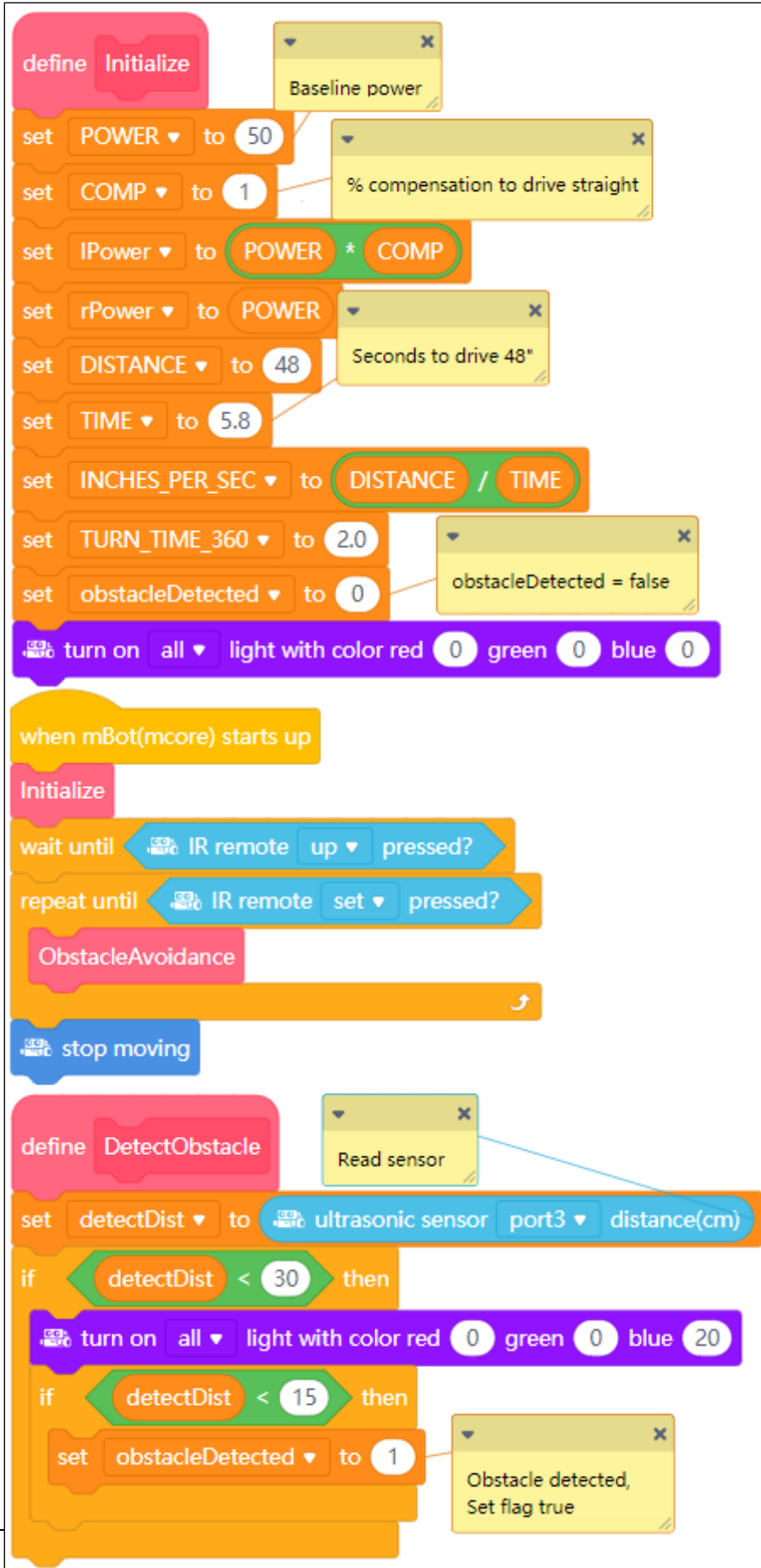
This program adds the Smart Obstacle Avoidance program we did earlier to our default program.

Tutorial Assignment

1. Start mBlock. Open **mBot Default Program Part 1 Remote Control**.
2. Save to your computer as **mBot Default Program Part 2 Obstacle Avoidance**.
3. Complete and test the program with the requirements listed.

Requirements

- Use **if then else** blocks to extend the **SetMode** code block to include Button B setting the obstacle avoidance mode.
- Button A starts remote control mode: modeFlag = 0
- Button B starts obstacle avoidance mode: modeFlag = 1
- Integrate **Smart Obstacle Avoidance** into the default program. The original code is shown below.
- Create and test the program.



define TurnRight degrees

set drvTime to $\text{degrees} / 360 * \text{TURN_TIME_360}$

left wheel turns at power lPower %, right wheel at power rPower * -1 %

wait drvTime seconds

stop moving

define TurnLeft degrees

set drvTime to $\text{degrees} / 360 * \text{TURN_TIME_360}$

left wheel turns at power lPower * -1 %, right wheel at power rPower %

wait drvTime seconds

stop moving

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 LookLeft

TurnLeft 90

wait .2 seconds

set detectL to ultrasonic sensor port3 distance(cm)

Find the distance to the obstacle on the left

define AvoidObstacle

turn on all light with color red 20 green 0 blue 0

LookLeft

LookRight

if detectL > detectR then

TurnLeft 180

define LookRight

TurnRight 180

wait .2 seconds

set detectR to ultrasonic sensor port3 distance(cm)

Find the distance to the obstacle on the right

set obstacleDetected to 0

turn on all light with color red 0 green 20 blue 0

Obstacle avoided, set flag false

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.