

# Obstacle avoiding mBot

Hold down the spacebar and mBot moves forward. If the ultrasonic sensor detects that it is closed to the object ahead (such as less than 10 cm), the mBot will turn to avoid obstacles and move on. If you release the spacebar, mBot stops.

```
when space key pressed
forever
  set dis to ultrasonic sensor Port2 distance
  if dis < 10 then
    set motor M1 speed 50
    set motor M2 speed -50
  else
    set motor M1 speed 50
    set motor M2 speed 50

when space key released
stop other scripts in sprite
set motor M1 speed 0
set motor M2 speed 0

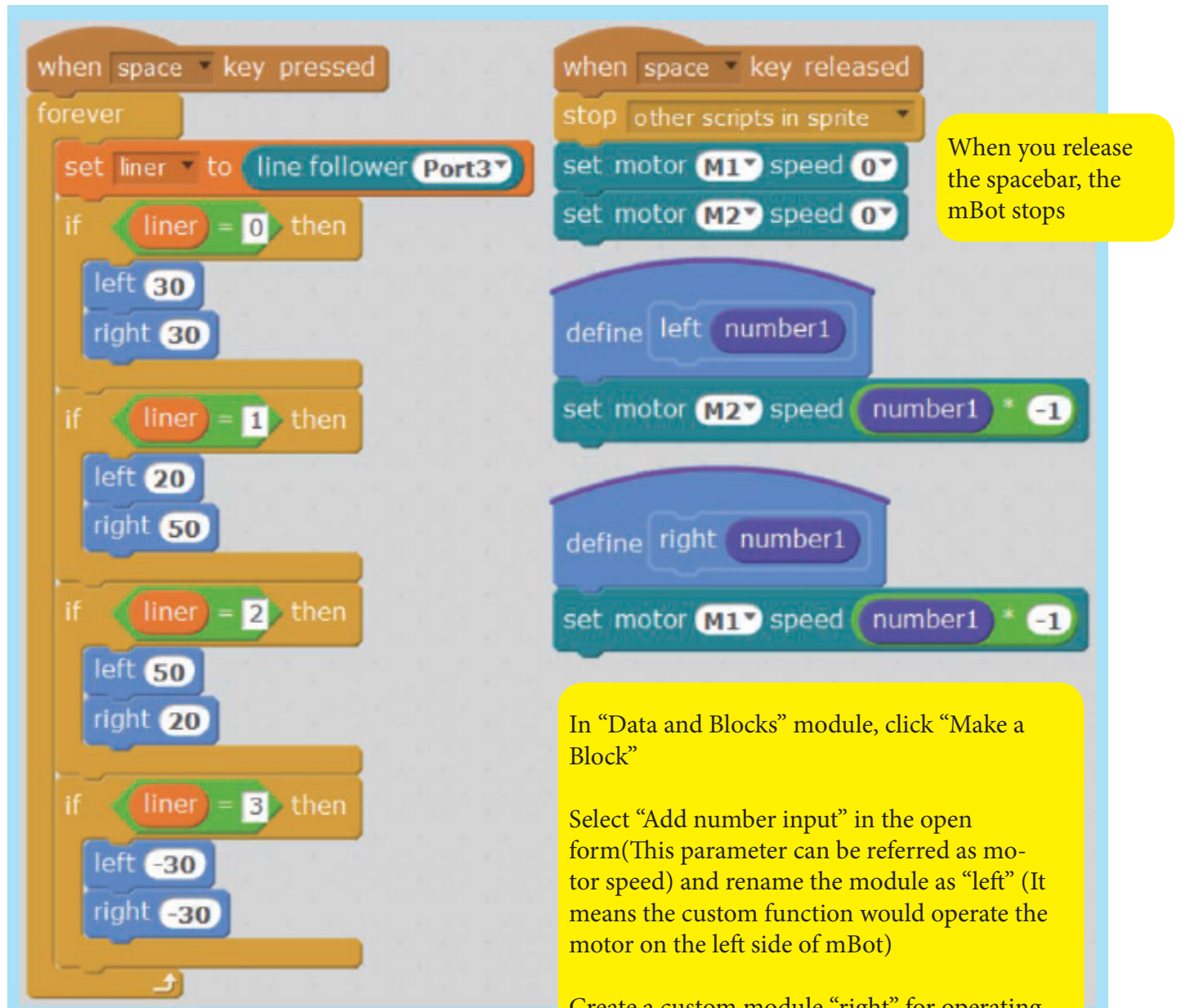
when space key pressed
forever
  if dis < 50 then
    play tone on note C4
    stop tone
    set led all red 150 green 0 blue 0
    set led all red 0 green 0 blue 0
    wait dis / 50 secs
```

If the “distance value” is less than 10, the two motors rotate in the opposite direction to make mBot turn. Otherwise, the two motors rotate forward and mBot moves forward.

Could you achieve following effect?  
When mBot moves forward, if there is an obstacle ahead (eg 50 cm away), mBot will be alerted and turn on alarm light.  
As obstacle is getting closer, alarm and light frequency will gradually accelerate until mBot turn.

# Line patrolling mBot

Hold down the spacebar and then mBot runs the program. Judge whether mBot is completely along the dark line. if it is, it moves straightly. Otherwise, it continues to judge whether mBot is on the left (right). If it is, it turns to the right (left) and make mBot return to the black line. If mBot is away from the black line, it will draw back to the black line. Repeat the cycle as this until you release the spacebar.



The image displays a Scratch script for controlling an mBot. The script is divided into two main sections: one triggered by the spacebar being pressed and another by it being released.

**When space key pressed:** This section contains a 'forever' loop. Inside the loop, the 'liner' variable is set to the 'line follower Port3' sensor. There are four conditional blocks based on the value of 'liner':

- if liner = 0 then:** Executes 'left 30' followed by 'right 30'.
- if liner = 1 then:** Executes 'left 20' followed by 'right 50'.
- if liner = 2 then:** Executes 'left 50' followed by 'right 20'.
- if liner = 3 then:** Executes 'left -30' followed by 'right -30'.

**When space key released:** This section starts with 'stop other scripts in sprite', followed by setting the speed of motor M1 and M2 to 0. Below this are two custom function blocks: 'left number1' and 'right number1'. The 'left' block sets motor M2 speed to 'number1 \* -1'. The 'right' block sets motor M1 speed to 'number1 \* -1'.

**Yellow callout boxes:**

- Top right: "When you release the spacebar, the mBot stops"
- Bottom left: "When you press the spacebar (hold down), mBot begins to judge the state of the line patrolling sensors. The rotation of the motor depends on the oset, which facilitate the direction adjustment of mBot."
- Bottom right: "In 'Data and Blocks' module, click 'Make a Block'". "Select 'Add number input' in the open form(This parameter can be referred as motor speed) and rename the module as 'left' (It means the custom function would operate the motor on the left side of mBot)". "Create a custom module 'right' for operating the motor on the right side of mBot"