


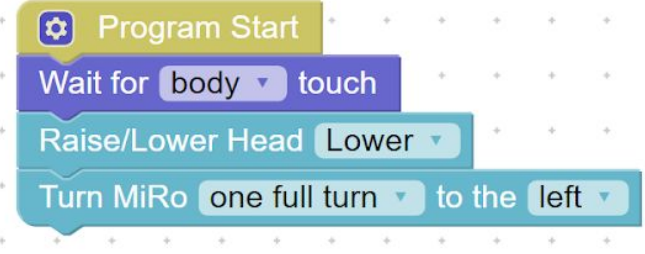
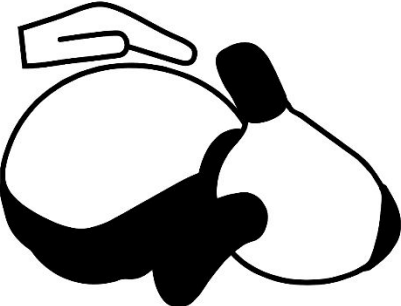




## Step-by-Step

Simulate MiRo to play a range of sounds in the MiRo simulator

### Program 1 - part (a)

Step	Image
<p><b>1 – Set Up</b></p> <ul style="list-style-type: none"> <li>• Add <b>Program Start</b> from <b>Setup</b>.</li> </ul>	
<p><b>2 – Add Sensor</b></p> <ul style="list-style-type: none"> <li>• Add <b>Wait for [body] touch</b> from <b>sensors</b>.</li> <li>• Connect to the <b>Program Start</b> block.</li> </ul>	
<p><b>3 – Add head movement</b></p> <ul style="list-style-type: none"> <li>• Add <b>Raise/Lower Head [Raise]</b> from <b>simple motion</b>.</li> <li>• Set to <b>Lower</b>.</li> <li>• Connect to the <b>Wait for body touch</b> block</li> </ul>	
<p><b>4 – Add body movement</b></p> <ul style="list-style-type: none"> <li>• Add <b>Turn MiRo [one quarter turn] to the [left]</b> from <b>simple motion</b>.</li> <li>• Set to <b>one full turn</b>.</li> <li>• Connect to <b>Raise/Lower Head [Lower]</b> block.</li> </ul>	
<p><b>10 – Simulate</b></p> <p>Click <b>Simulator</b> and run your program to see if your prediction was correct.</p> <p>Click <b>Cancel</b> to stop the simulation.</p> <p>To start the simulation again you can reset the world.</p>	
<p><b>Modify</b></p>	<p>What can you modify within the blocks? What effect does this have?</p>

## part (b)

### Step 1 -

Flip to Python code by clicking on the **python** button.

Can you see the code for the full turn?

Can you edit this to do a half turn?



```
1 import time
2 import miro2 as miro
3
4
5 # connect to robot
6 robot = miro.interface.PlatformInterface(enable_pose_ctrl=False, enable_cliff_reflex=False)
7
8 ##### robot is now connected #####
9
10 while not any(robot.read_body_touch_sensors()):
11     time.sleep(0.025)
12     robot.set_neck(miro.constants.JOINT_LIFT, 60)
13     robot.step_turn(+360)
14
```



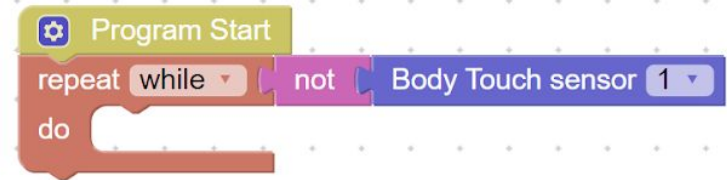
### Step 5

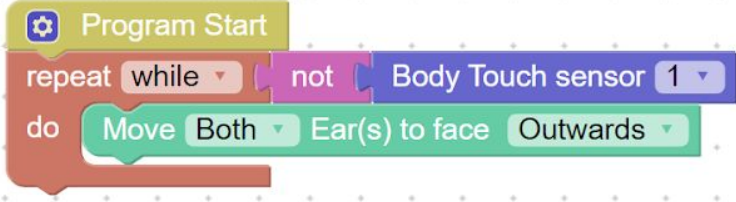


Run your program

Experiment with the settings and investigate:

- ◆ Change the degrees of the turn to see the different outputs.

## Program 2 - part (a)

Step	Image
<b>1 – Set Up</b> <ul style="list-style-type: none"><li>● Add <b>Program Start</b> from <b>Setup</b>.</li></ul>	
<b>2 – Add Loop</b> <ul style="list-style-type: none"><li>● Add <b>repeat [while]</b> from <b>loops</b>.</li><li>● Connect to the <b>Program Start</b> block.</li></ul>	
<b>3 – Add conditional statement</b> <ul style="list-style-type: none"><li>● Add <b>not</b> from <b>logic</b>.</li><li>● Connect to the <b>repeat [while]</b> block.</li><li>● Add <b>Body Touch sensor [0]</b> from <b>sensors</b>.</li><li>● Set to <b>1</b>.</li><li>● Connect to <b>not</b> block.</li></ul>	

<p><b>4 – Add output if true</b></p> <ul style="list-style-type: none"> <li>• Add <b>Move [Left] Ear(s) to face [Forwards]</b> from <b>emotion</b>.</li> <li>• Set to <b>Move [Both] Ear(s) to face [Outwards]</b>.</li> <li>• Connect into the <b>repeat [while]</b> block.</li> </ul>	
<p><b>4 – Add output if false</b></p> <ul style="list-style-type: none"> <li>• Add <b>Start Wagging Tail [Slowly]</b> from <b>emotion</b>.</li> <li>• Set to <b>Fastest</b>.</li> <li>• Connect after the <b>repeat [while]</b> block.</li> <li>• Add <b>Wait for [1] second</b> from <b>time</b>.</li> <li>• Set to <b>2</b>.</li> <li>• Connect to <b>Start Wagging Tail [Fastest]</b> block.</li> </ul>	
<p><b>10 – Simulate</b></p> <p>Click <b>Simulator</b> and run your program to see if your prediction was correct.</p> <p>Click Cancel to stop the simulation.</p> <p>To start the simulation again you can reset the world.</p>	
<p><b>Modify</b></p>	<p>What can you modify within the blocks? What effect does this have?</p>

## part (b)

### Step 1 -

Flip to Python code by clicking on the **python** button.

Can you change the time set?



```
1 import time
2 import miro2 as miro
3
4
5 # connect to robot
6 robot = miro.interface.PlatformInterface(enable_pose_ctrl=False, enable_cliff_reflex=False)
7
8 ##### robot is now connected #####
9
10 while not robot.read_body_touch_sensors()[1]:
11     robot.set_joint(miro.constants.JOINT_EAR_L, 1.0)
12     robot.set_joint(miro.constants.JOINT_EAR_R, 1.0)
13 robot.wag_tail(3)
14 robot.sleep(2)
15
```

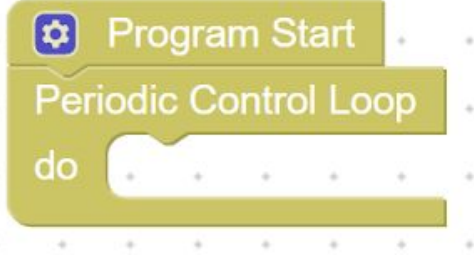
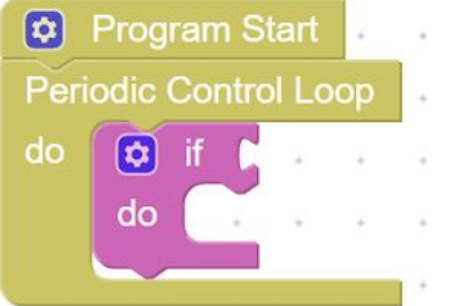
### Step 5

Run your program

Experiment with the settings and investigate:

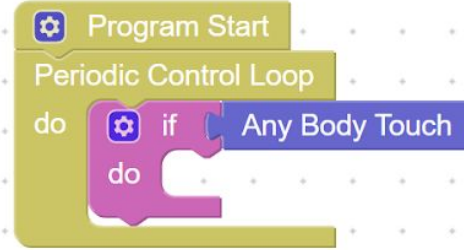
- ◆ Change the time used to see the different outputs.

## Program 3 - part (a)

Step	Image
<p><b>1 – Set Up</b></p> <ul style="list-style-type: none"><li>● Add <b>Program Start</b> from <b>setup</b>.</li><li>● Add <b>Periodic Control Loop</b> from <b>setup</b>.</li><li>● Connect to <b>Program Start</b> block.</li></ul>	
<p><b>2 – Add Selection</b></p> <ul style="list-style-type: none"><li>● Add <b>if do</b> from <b>logic</b>.</li><li>● Connect into the <b>Periodic Control Loop</b> block.</li></ul>	

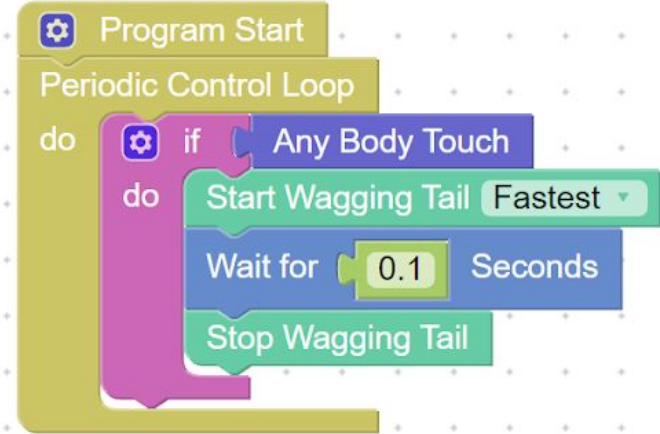
### 3 – Add conditional statement

- Add **Any Body Touch** from **sensors**.
- Connect to the **if** block.



### 4 – Add output if true

- Add **Start Wagging Tail [Slowly]** from **emotion**.
- Set to **Fastest**.
- Connect into the **if do** block.
- Add **Wait for [1] second** from **time**.
- Set to **0.1**.
- Connect to **Start Wagging Tail [Fastest]** block.
- Add **Stop Wagging Tail** from **emotion**.
- Connect to **Wait for [0.1] seconds** block.

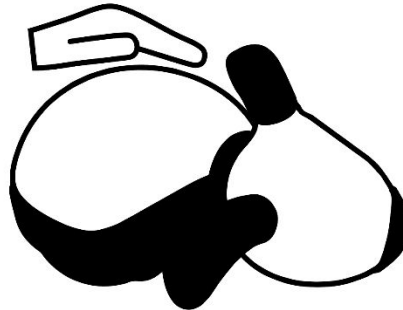


### 10 – Simulate

Click **Simulator** and run your program to see if your prediction was correct.

Click Cancel to stop the simulation.

To start the simulation again you can reset the world.



### Modify

What can you modify within the blocks?  
What effect does this have?

## part (b)

### Step 1 -

Flip to Python code by clicking on the **python** button.

Can you narrate the code?



```
1 import time
2 import miro2 as miro
3
4
5 # connect to robot
6 robot = miro.interface.PlatformInterface(enable_pose_ctrl=False, enable_cliff_reflex=False)
7
8 #### robot is now connected ####
9
10
11 # main control loop
12 while robot.ready():
13     if any(robot.read_body_touch_sensors()):
14         robot.wag_tail(3)
15         robot.sleep(0.1)
16         robot.wag_tail(0)
17
```

### Step 5

Run your program  
Experiment with the settings and investigate.