



**Logic**

**Space**



**Coding**



**Focus**



# Classroom Discipline

**01**

Please sit down and keep quiet in class.

**02**

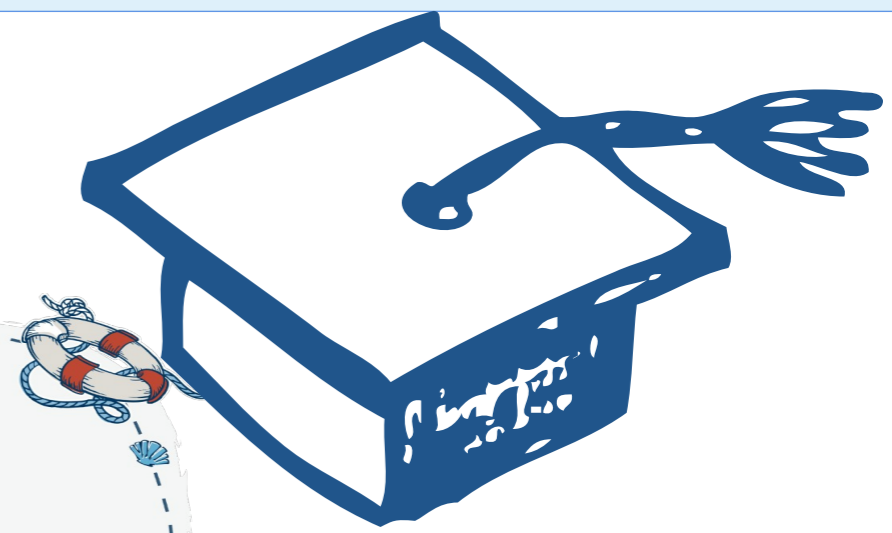
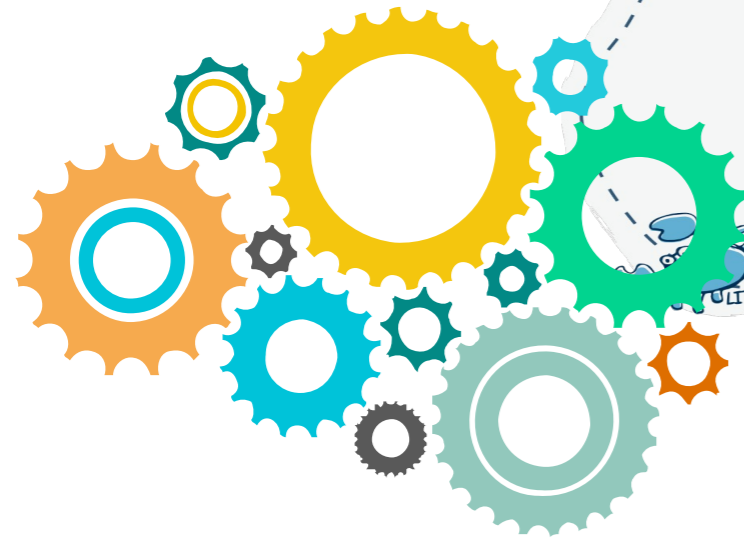
Please raise your hand if you have any questions.

**03**

Please observe carefully when the pictures are played.



# Mouse 01





# Course Goals



Thinkidea

1

Learning goals

2

Project Discussion

3

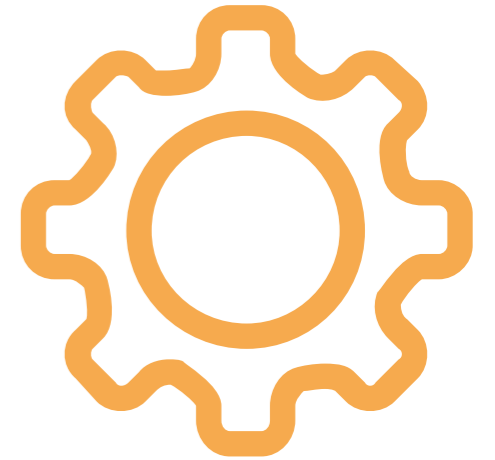
Logic Programming

4

Have a try

5

Consolidate and extend





1

Create a mechanical mouse and control It with intelligent commands.

2

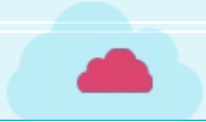
Consolidate the modules like **"if...then..."** 、 **" Operators <"** 、 **" Sense"** .

3

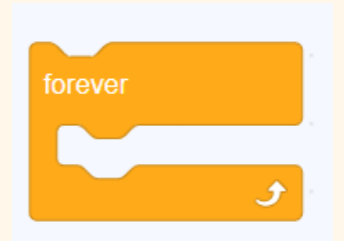
Learn new modules **"if...then...else"** 、 **" light"** .

4

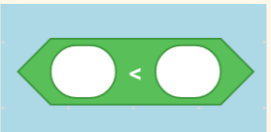
Comprehensively apply the learned modules to complete programming projects and expand.

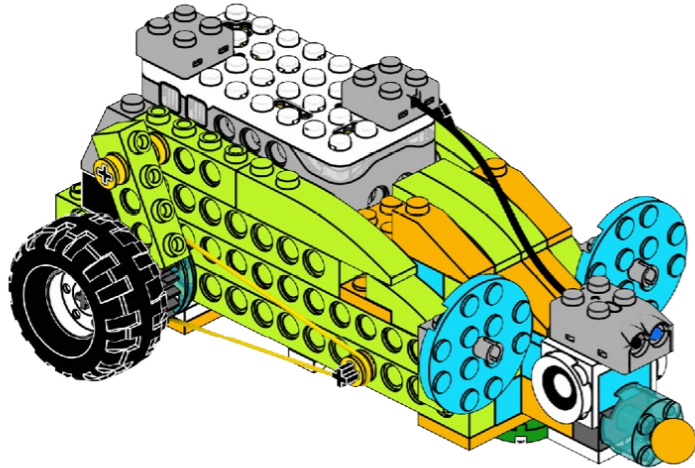


Consolidate  
modules:



New  
modules:



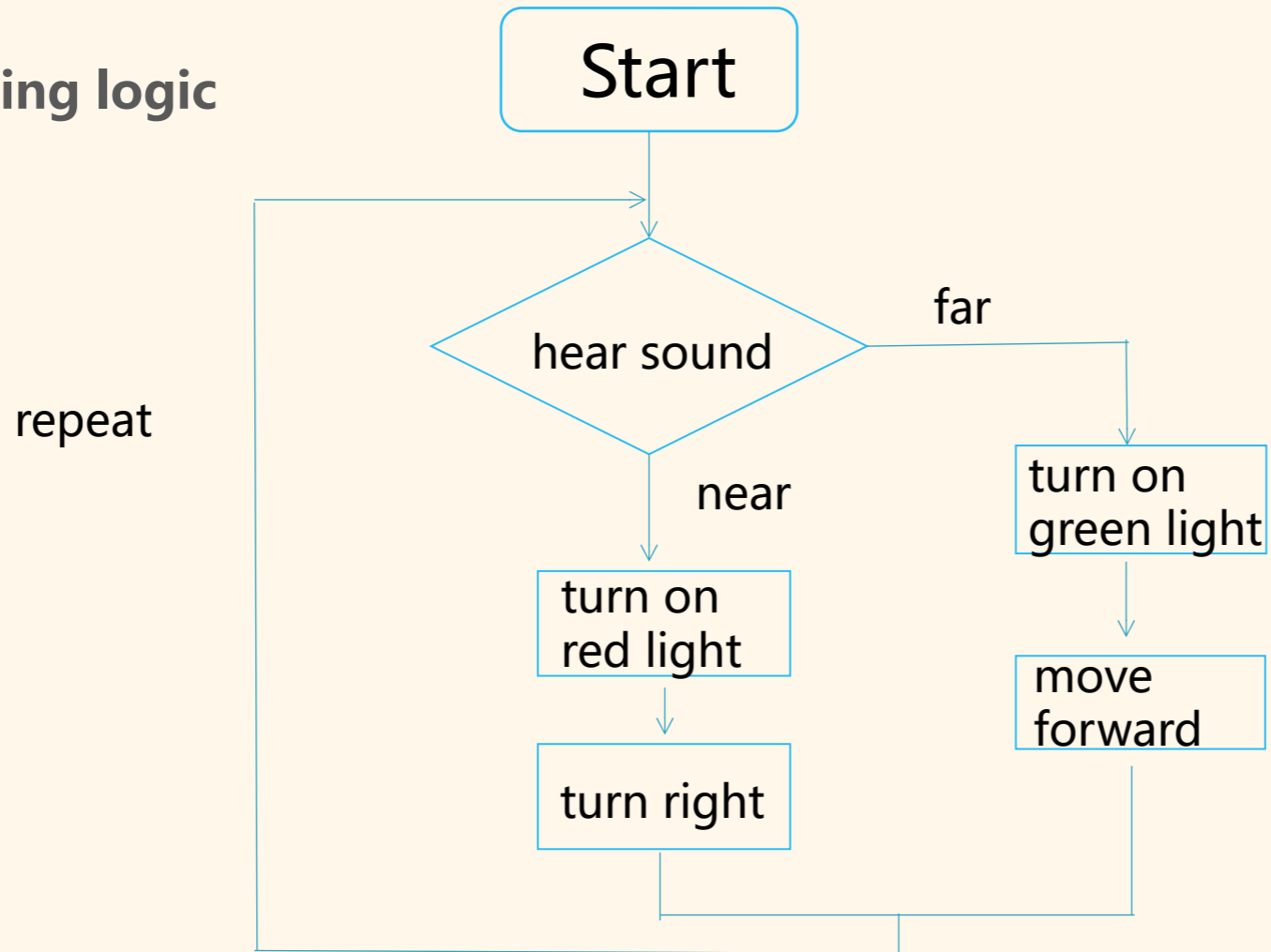


## Project Discussion

- 1.The mechanical mouse moves forward with the green light on.**
- 2.When the mouse hears a sound.**
- 3.Turn on the red light.**
- 4.Turn right.**
- 5.Keep moving forward with the green light on.**



## 1. Programming logic





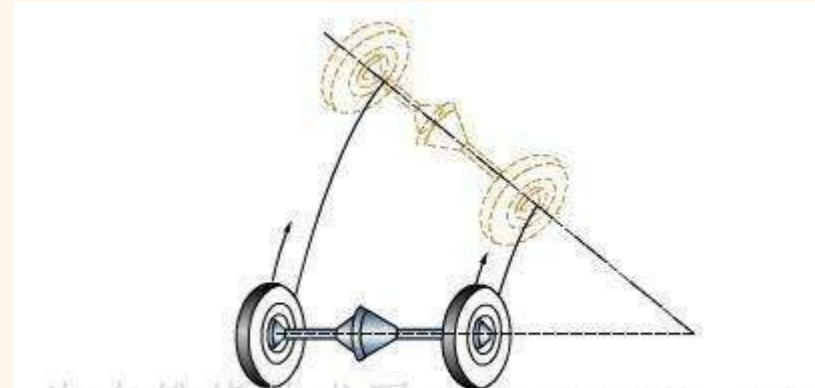
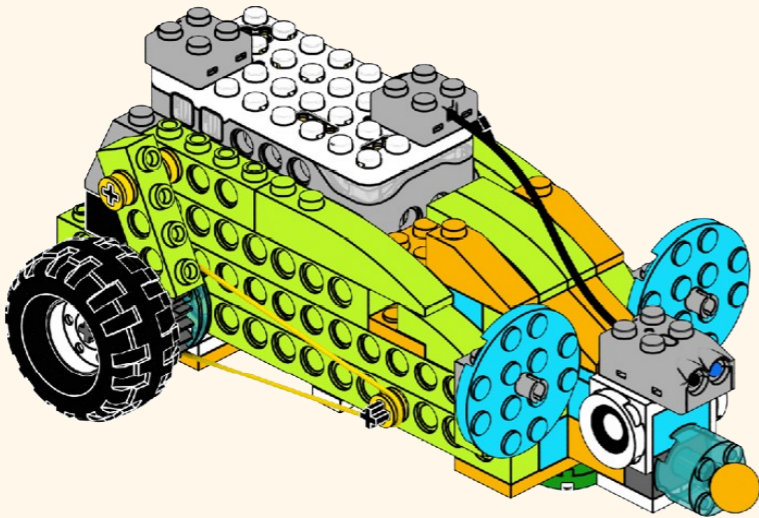
## 1.Thinking

# How do we program the mouse to turn?

There must be a **speed difference** between the two wheels.

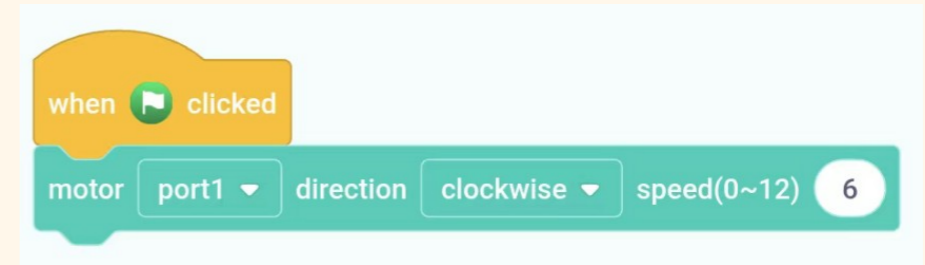
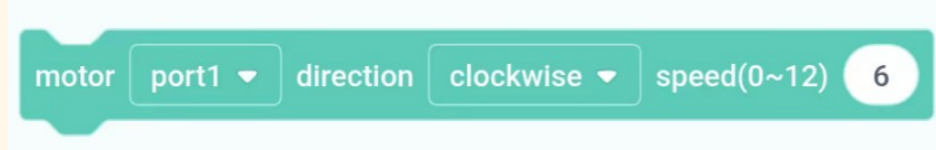
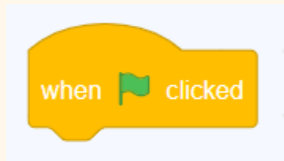
How can we control the speeds of two wheels using only one motor?

Ratchet and pawl mechanism

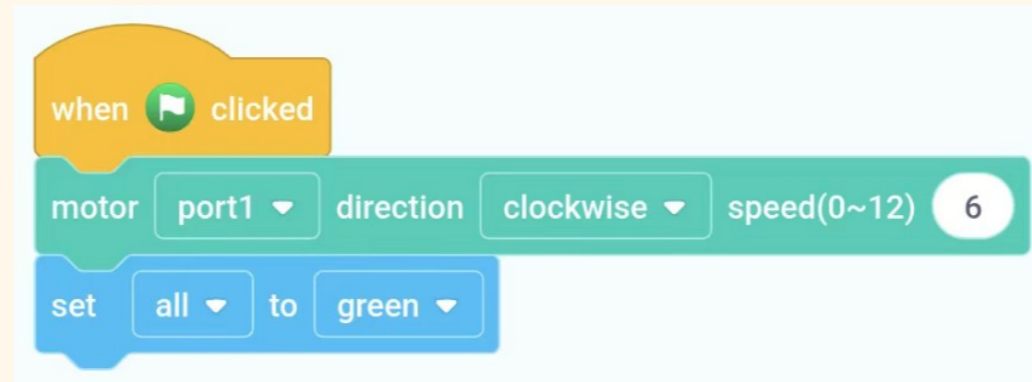
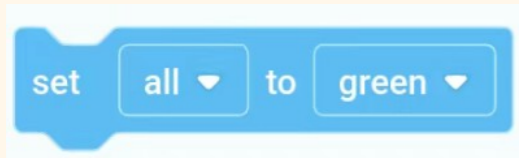


# 1. Programming logic

1. The mouse starts moving forward.

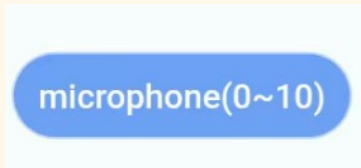


2. The green light on its back turns on.

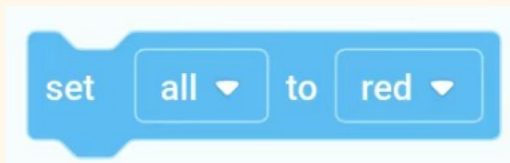


# 1. Programming logic

## 1. When it hear a sound

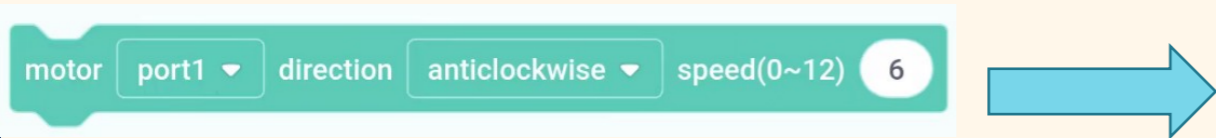


## 2. The red warning light on the back turns on.

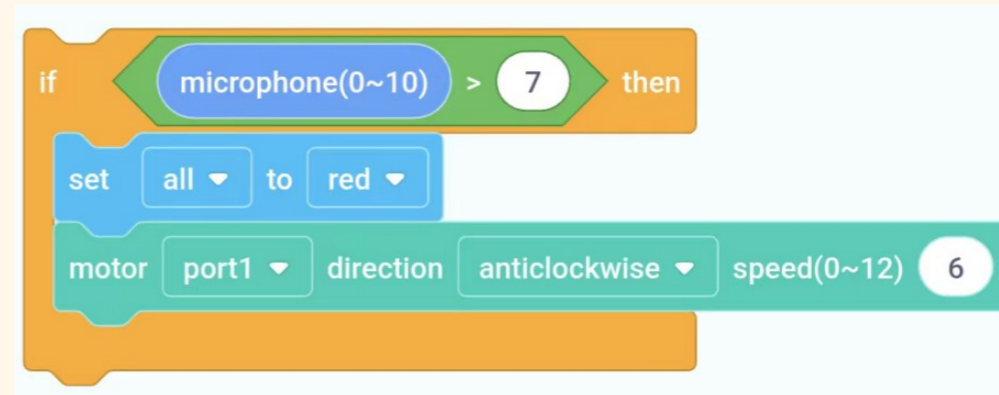


# 1. Programming logic

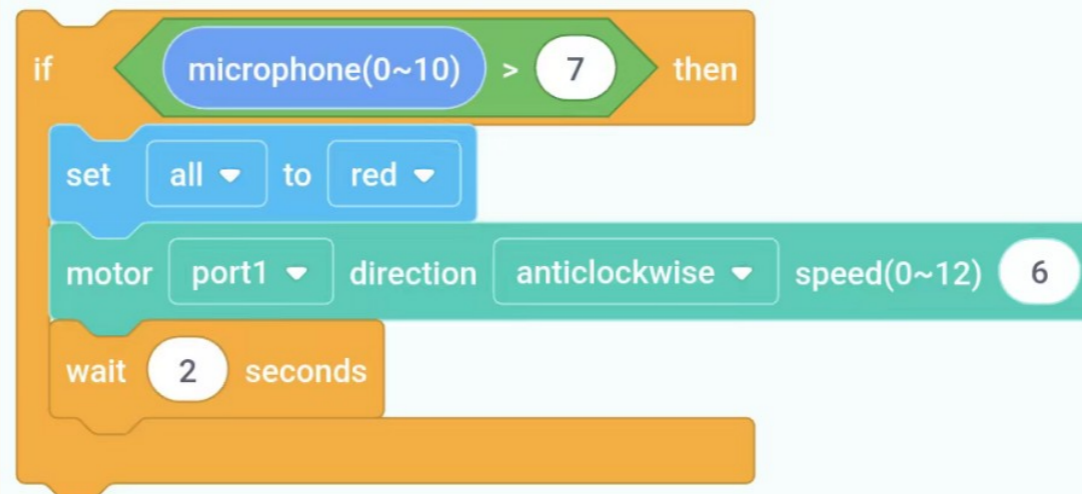
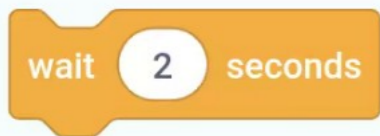
## 1. How do we create differential speed?



How does it work?

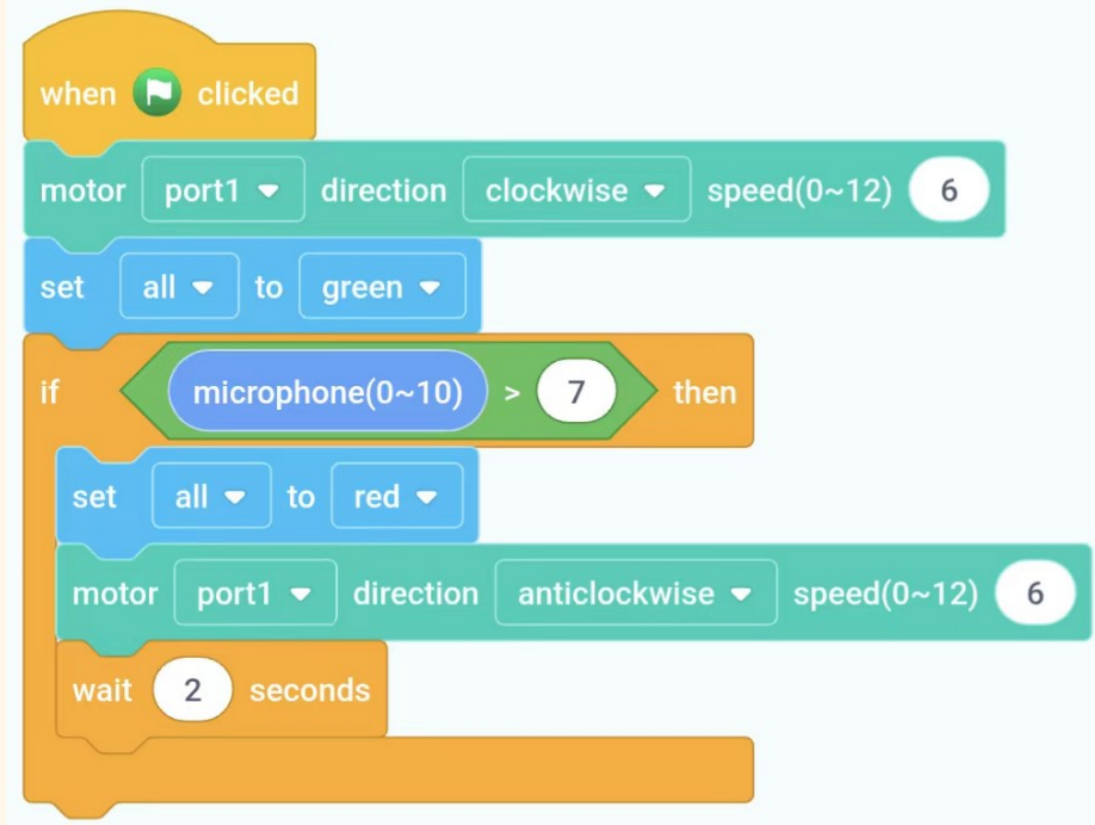


## 2. Make a turn



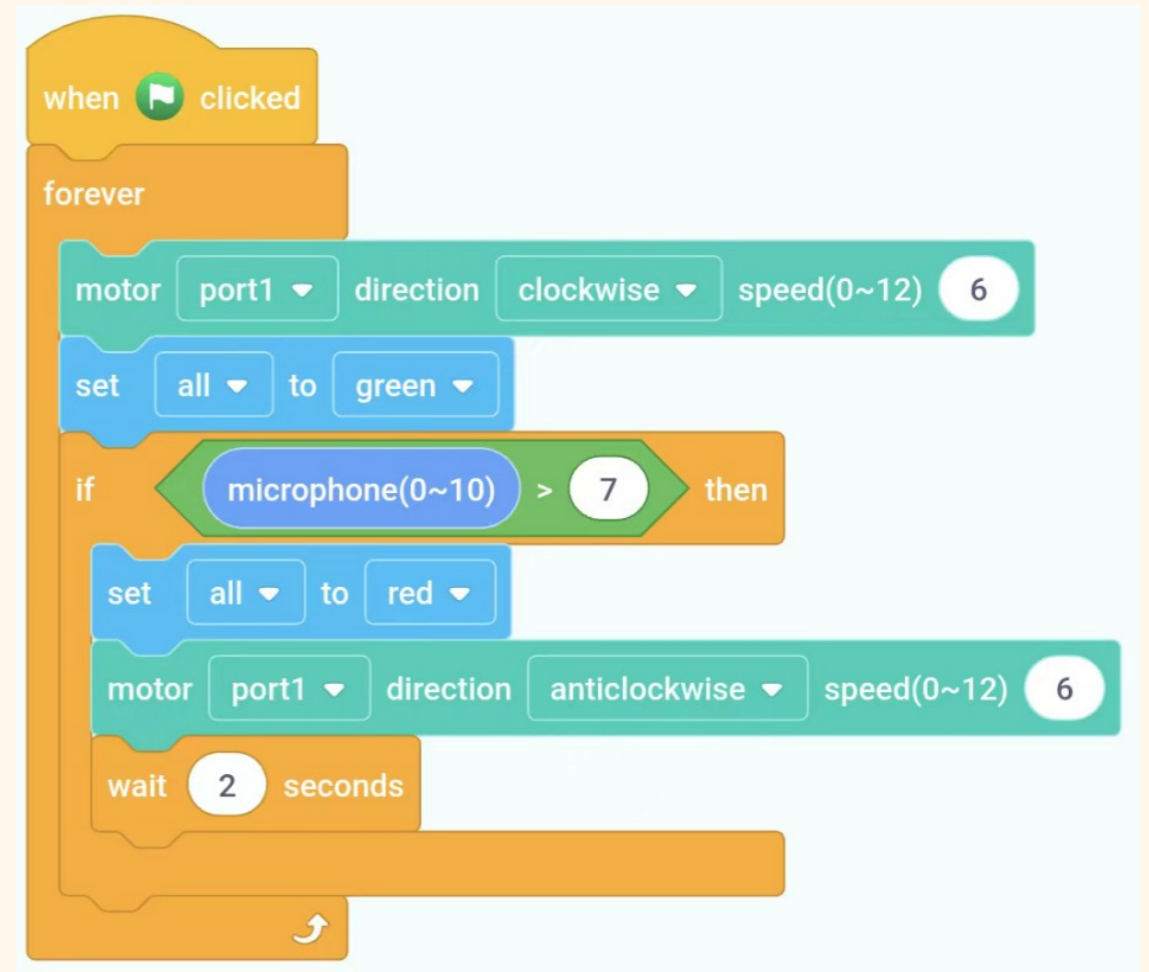
# 1. Programming logic

## 1. Is it done?



```
when clicked clicked
  motor port1 direction clockwise speed(0~12) 6
  set all to green
  if microphone(0~10) > 7 then
    set all to red
    motor port1 direction anticlockwise speed(0~12) 6
    wait 2 seconds
```

The code block starts with a 'when clicked' trigger. It then sets the motor to port 1, clockwise direction, and speed 6. Next, it sets all lights to green. An 'if' block checks if the microphone level is greater than 7. If true, it sets all lights to red, reverses the motor to anticlockwise direction at speed 6, and waits for 2 seconds.

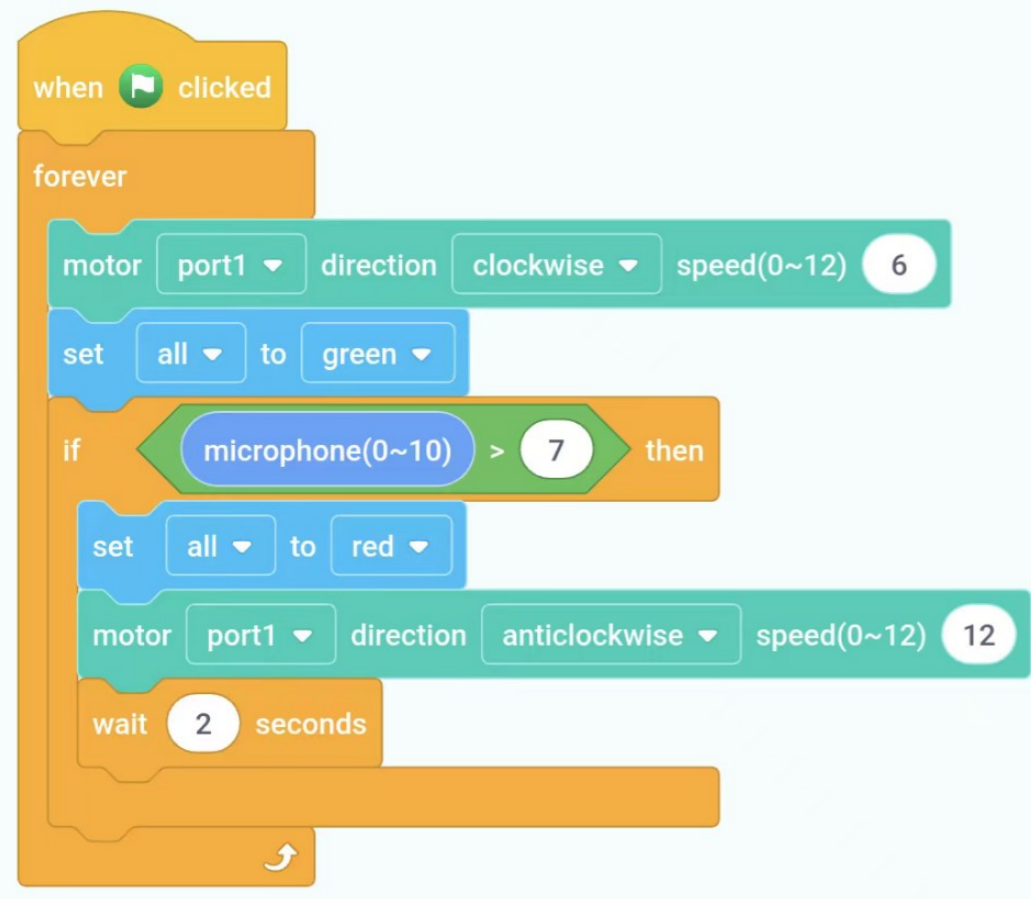


```
when clicked clicked
  forever
    motor port1 direction clockwise speed(0~12) 6
    set all to green
    if microphone(0~10) > 7 then
      set all to red
      motor port1 direction anticlockwise speed(0~12) 6
      wait 2 seconds
```

The code block starts with a 'when clicked' trigger. It then enters a 'forever' loop. Inside the loop, it sets the motor to port 1, clockwise direction, and speed 6. Next, it sets all lights to green. An 'if' block checks if the microphone level is greater than 7. If true, it sets all lights to red, reverses the motor to anticlockwise direction at speed 6, and waits for 2 seconds. The loop then repeats.

# 1. When the distance is close, the mouse moves forward.

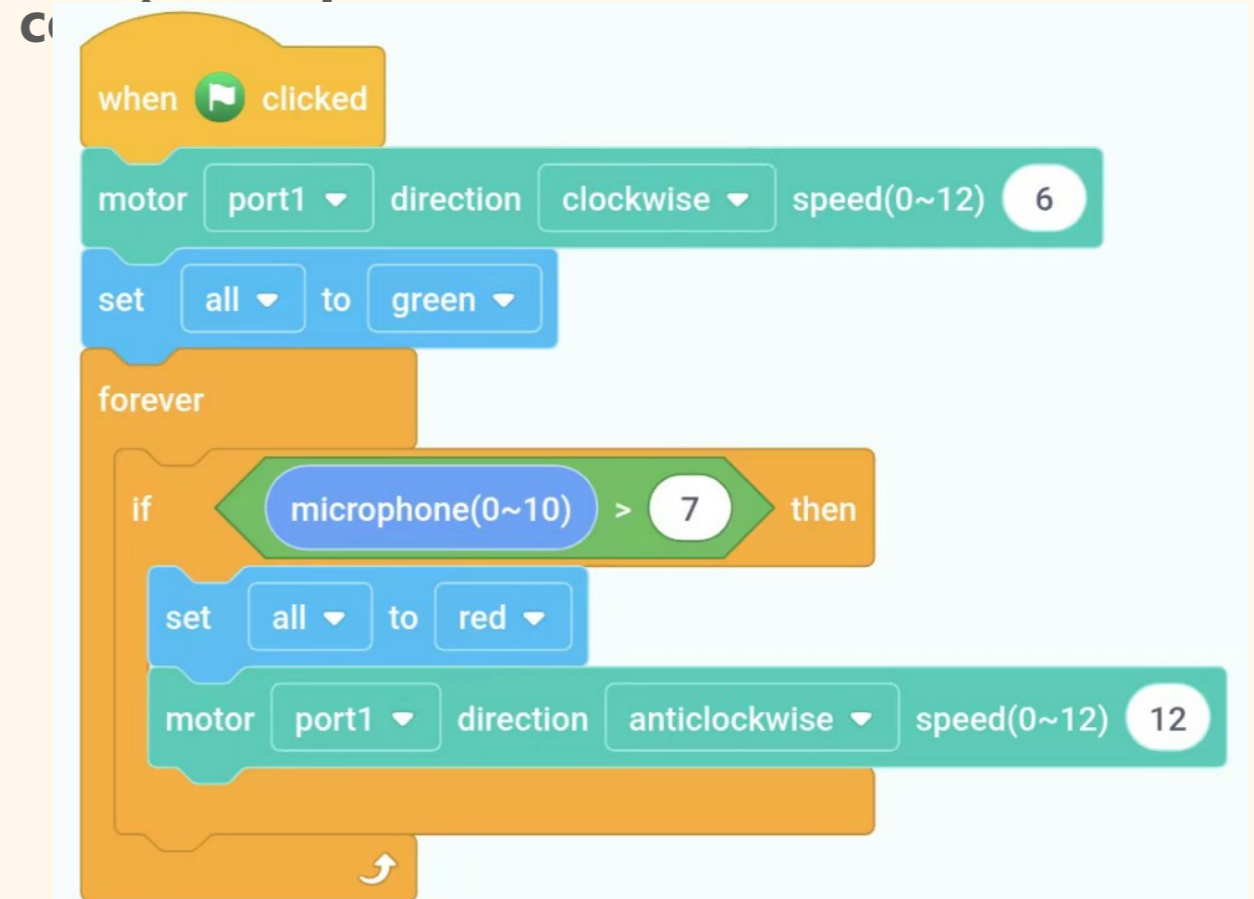
Task 1: When the mouse hears a sound, it makes a quick turn.



```
when clicked
  forever
    motor port1 direction clockwise speed(0~12) 6
    set all to green
    if microphone(0~10) > 7 then
      set all to red
      motor port1 direction anticlockwise speed(0~12) 12
      wait 2 seconds
```

The code for Task 1 starts with a 'when clicked' event block. It enters a 'forever' loop. Inside the loop, it sets motor port1 to rotate clockwise at speed 6. Then, it sets all lights to green. An 'if' block checks if the microphone level (0~10) is greater than 7. If true, it sets all lights to red and changes the motor to rotate anticlockwise at speed 12. Finally, it waits for 2 seconds before looping back.

Task 2: When the mouse hears a sound, it keeps spinning



```
when clicked
  motor port1 direction clockwise speed(0~12) 6
  set all to green
  forever
    if microphone(0~10) > 7 then
      set all to red
      motor port1 direction anticlockwise speed(0~12) 12
```

The code for Task 2 starts with a 'when clicked' event block. It sets motor port1 to rotate clockwise at speed 6 and sets all lights to green. It then enters a 'forever' loop. Inside the loop, an 'if' block checks if the microphone level (0~10) is greater than 7. If true, it sets all lights to red and changes the motor to rotate anticlockwise at speed 12. The loop continues to check the microphone level.



## Consolidate and extend

**Q1 :** Alex wrote a program for the mouse. How will the mouse behave?

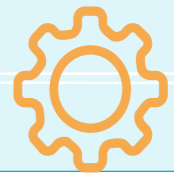
```

when clicked
  forever
    motor port1 direction clockwise speed(0~12) 6
    set all to green
    if microphone(0~10) > 7 then
      set all to off
      motor port1 direction anticlockwise speed(0~12) 12
      wait 2 seconds
  
```

**A1 :** The green light on the back is on. When a sound is detected, the light turns off and the mouse turns right.



Q &  
A



# Knowledge Review



(1)

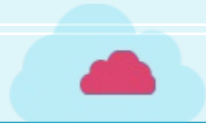


The IF instruction (if–then–else) is a commonly used logic block and is usually used together with a repeat loop.

(2)



The comparison block checks which value in the two slots is larger or smaller.



# Knowledge Review



(3)

microphone(0~10)

Receive volume

(4)

wait 1 seconds

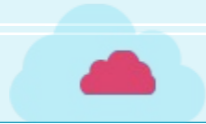
The program runs in sequence, with a waiting time interval between the two scripts.

Alex programmed the mouse like this, but the mouse still moves forward after hearing the sound. Why is that?

```
when clicked
  forever
    motor port1 direction clockwise speed(0~12) 6
    set all to green
    if microphone(0~10) > 7 then
      set all to red
      motor port1 direction clockwise speed(0~12) 12
      wait 2 seconds
```

- A** The motor direction is set incorrectly.      **B** The sound is not loud enough.
- C** No loop module is used.      **D** The mouse can't hear the sound.



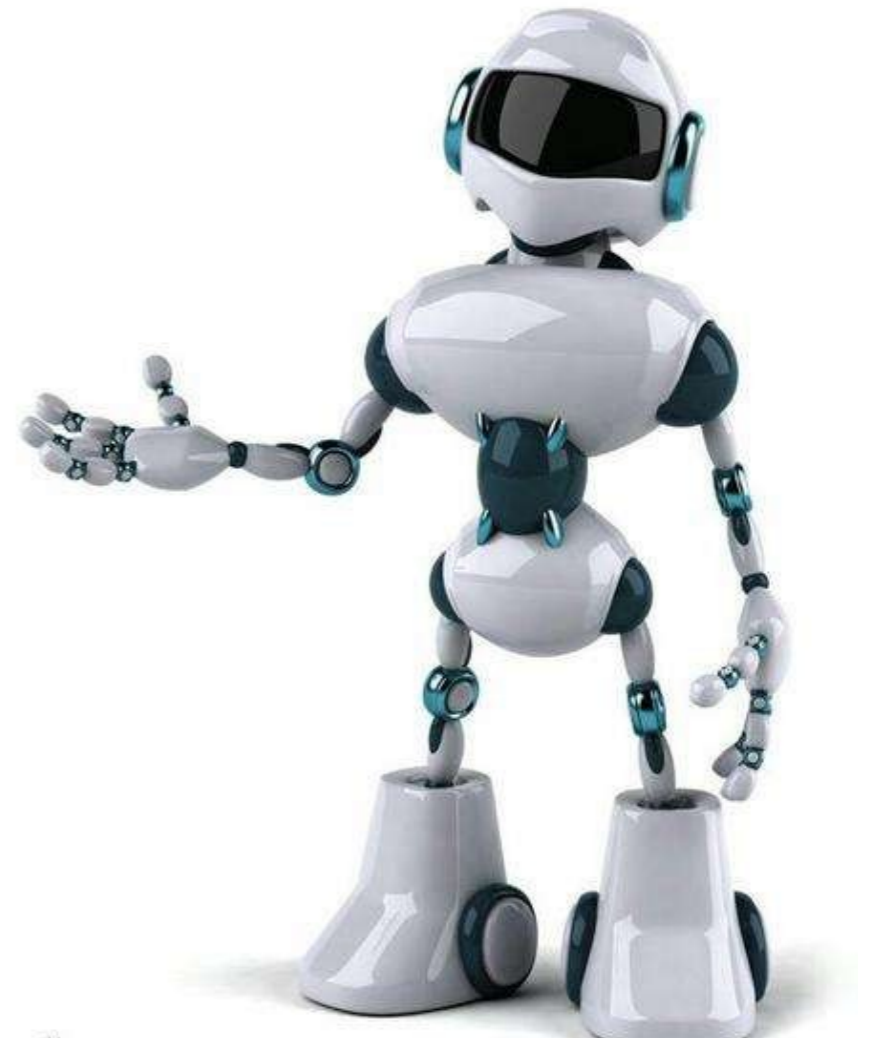


Answer **A**

:

Analysis **Because the motor's rotation direction is incorrect.**

```
when clicked
  forever
    motor port1 direction clockwise speed(0~12) 6
    set all to green
    if microphone(0~10) > 7 then
      set all to red
      motor port1 direction anticlockwise speed(0~12) 12
      wait 2 seconds
```





**Talk**





**THANKS**

