Chapter 3

Walking Emoji

Emojis are now considered to be a large part of popular culture these days. Maqueen Plus also has his emojis. In this chapter, let's control Maqueen Plus to walk along a circle while displaying emojis on its LED screen.
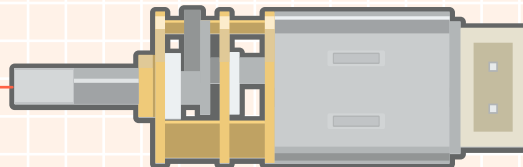
Goal

1. Learn the differential steering principle
2. The function of "pause" block

Electronic Component

Motor Brief

Motor

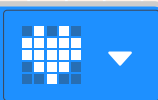Motors can be used to drive Maqueen Plus to move left, right, backward, or go straight.

Command Learning

Block Brief

Show Icon

show icon ▼

Draw the selected icon on the LED screen

Motor Controlling

Motor left ▼ stop

Control the speed and direction of the motor

Pause

pause(ms) 100 ▼

Pause for the specified time in millisecond
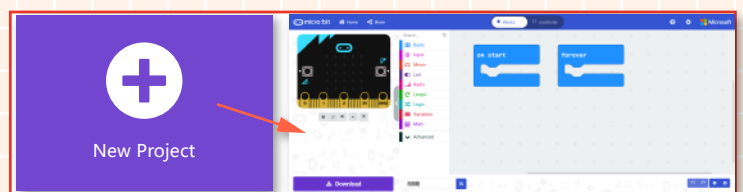
Hands-on Practice

Step 1 Create a New Project

1. Input https://makecode.microbit.org/ into your browser to enter MakeCode editor.
2. Click "new project" to enter MakeCode programming interface.
3. Add the Maqueen Plus library:https://github.com/DFRobot/pxt-DFRobot-Maqueenplus
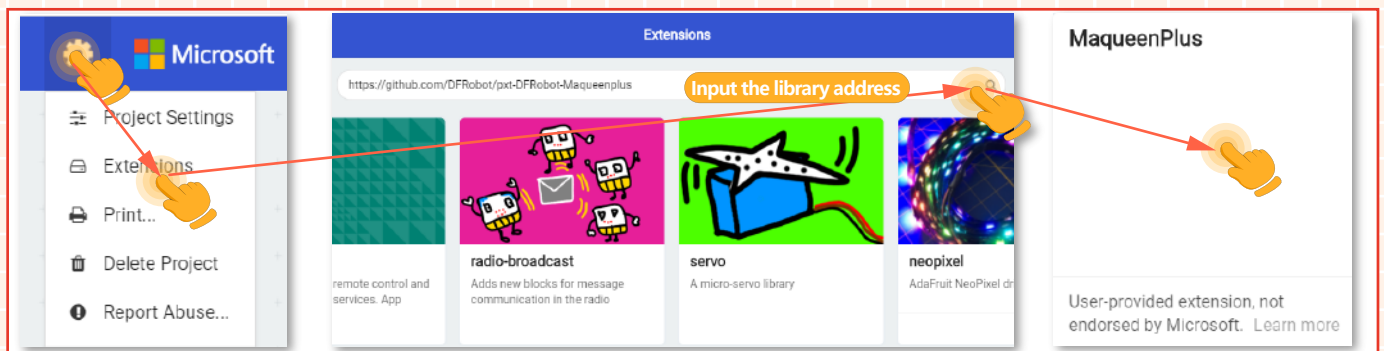
https://makecode.microbit.org/

New Project
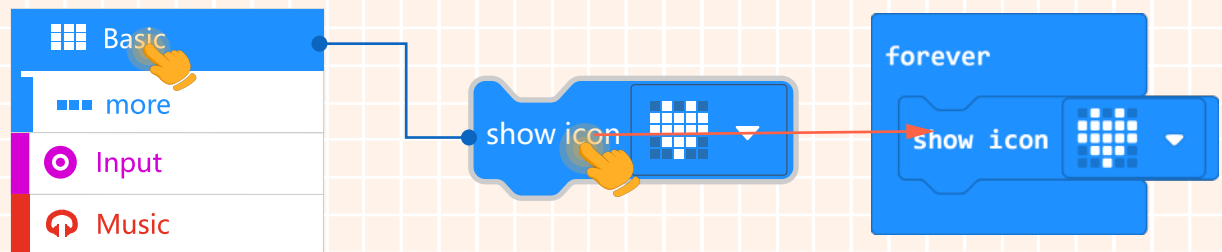
1.Enter MakeCode editor

2.Enter programming interface

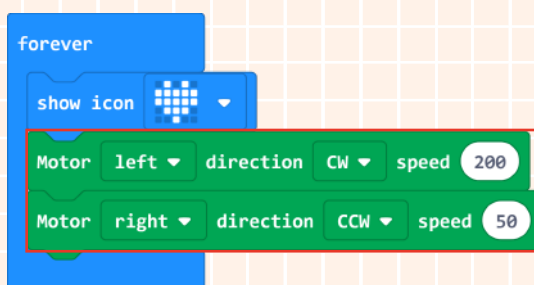3.Add the extension library

Step 2 Programming

1.Display emojis

Drag the "show icon"block into a "forever" block, then a heart pattern will be displayed on the micro:bit LED matrix.

Note: click the drop-down arrow to select other patterns.
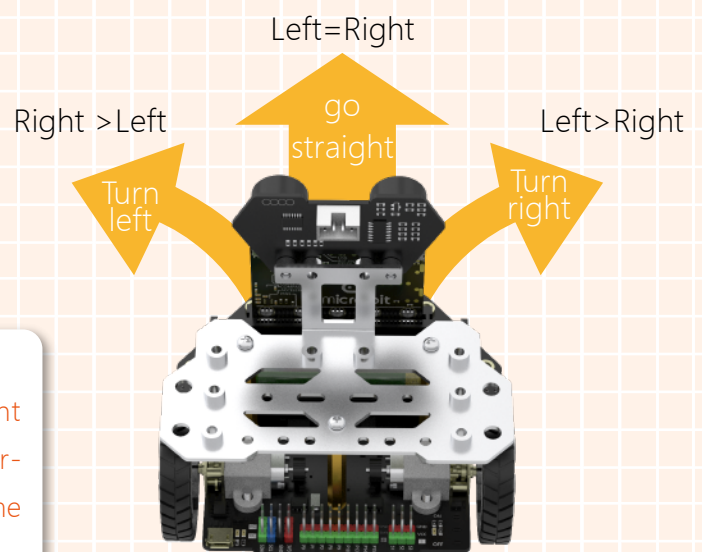
2.Maqueen Plus moves clockwise

Program Maqueen Plus to drive clockwise along a circle. According to the differential steering principle, make the left motor rotate forward at the speed of 200, and the right motor rotates forward at 50.
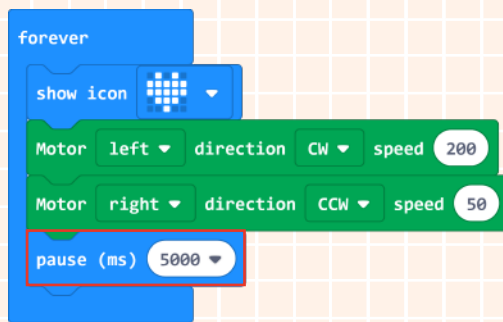

Knowledge Expansion

Differential Steering Principle:

When the speed and direction of the left and right wheels are all the same, the robot car will move forward or backward. If the two wheels rotate in the same direction at different speeds, it will turn left or right.
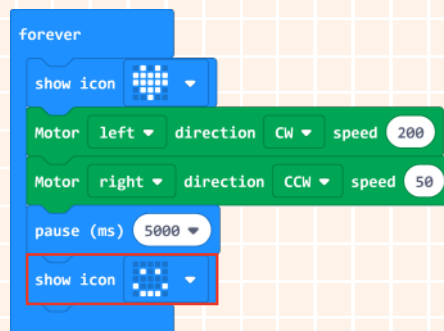
3.Maqueen Plus drives along a circle

(1)Let Maqueen Plus move along a circle. Set the pause time via the pause module to make it drive a perfect circle.
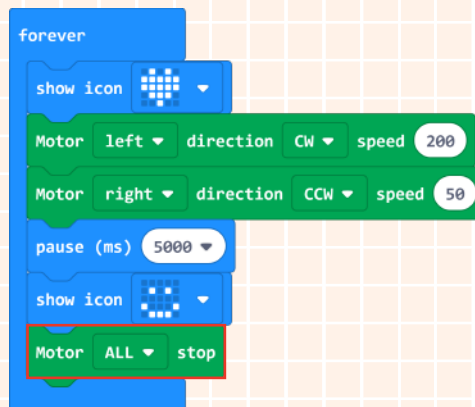
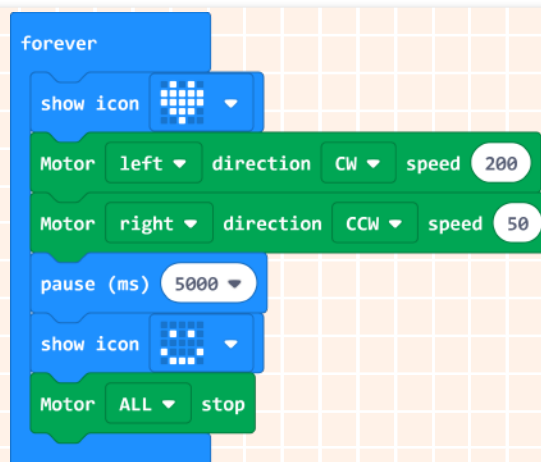(2)When Maqueen Plus has walked a complete circle, display a smiley face on its LED screen.

4.Maqueen Plus stops

Maqueen Plus will drive along a circle repeatedly. Now we can use another motor control block to make it stop. As shown below, change the "left" to "all", then both motors will stop rotating.

5.Complete Program

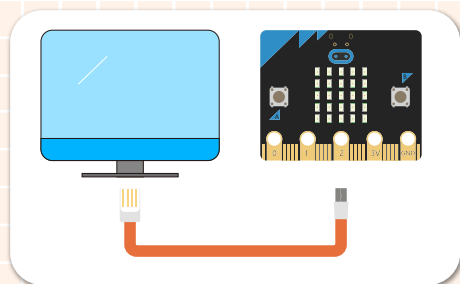6.Name your project as "Walking Emoji" and save it.
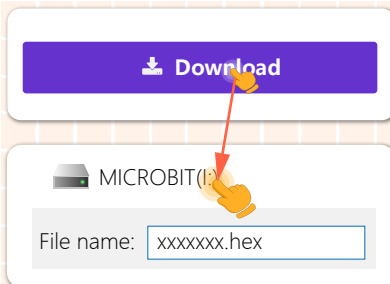
Walking Emoji

Step 3 Download Program

1.**Connect to a computer:** connect the micro:bit to your computer with a USB cable before downloading. There will be a hard-disk named micro:bit appearing in the computer when the connection is successful.

2.**Download the program:** download your project into the micro:bit hard-disk.

3.**Plug in the micro:bit board:** after downloading the program, plug the micro:bit board into Maqueen Plus.

⬇ **Download**

MICROBIT(I:)

File name: xxxxxxx.hex

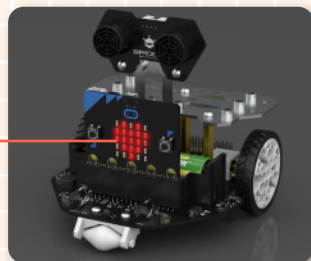| 1.Connect to computer | 2.Download program | 3.Plug in micro:bit |

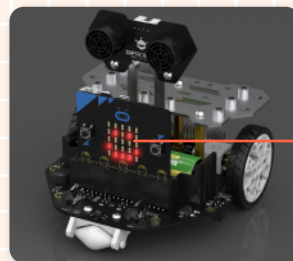## Step 4 Effect Display

Turn on the power switch, then Maqueen Plus will start to run along a circle while showing a heart pattern on its face. When he stops, a smiley pattern will be displayed on his screen.

Walking:
heart shape

Walking completed:
smiley face

Think & Explore ❓

How is the movement state when the two motors are rotating at different speeds and directions? Program Maqueen Plus to explore, and complete the form below.

	Left Motor		Right Motor		Movement
	Speed	Direction	Speed	Direction	
1	200	Forward	200	Forward	Forward
2	200	Forward	50	Forward	
3	50	Forward	200	Forward	
4	200	Backward	200	Backward	
5	200	Backward	200	Forward	