DFROBOT
DRIVE THE FUTURE

Crazy Maqueen

Game Map

There are 3 playing modes for Crazy Maqueen, and each mode includes missions with different levels. The further you advance, the harder it will be, challenge now!

Walking Maqueen

Light Chaser

Rhythm Master

Singer Maqueen

Little Tagalong

Streetcar

Little Math Expert

Drawer

Dancer

Maqueen's Commander

Motion controlled Robot Car

Gamepad+Maqueen

Flying Chess

Single Player Mode

Interactive Mode

Multiplayer Mode

Preparation

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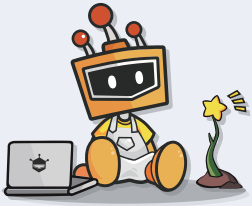
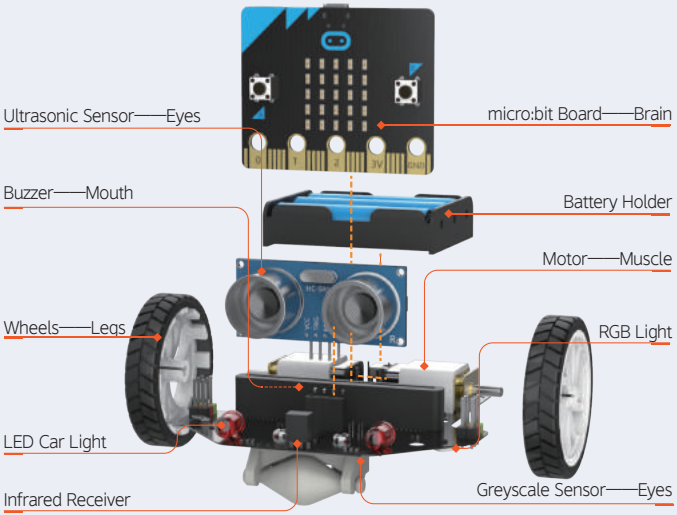
Let's get to know Maqueen and check its equipment before we get started.

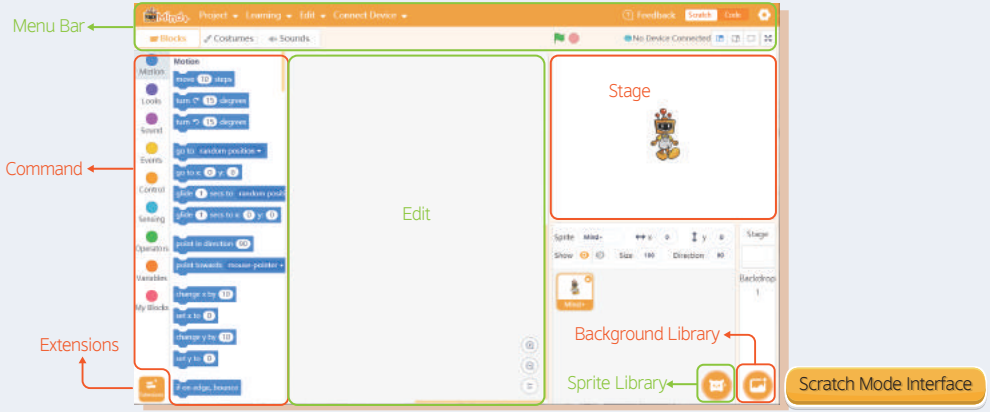




Preparation

To complete all missions, you must occupy an important commanding base—mind+. Once you get it, you can control Maqueen with ease!
Visit the website as below to get this fantastic assist!

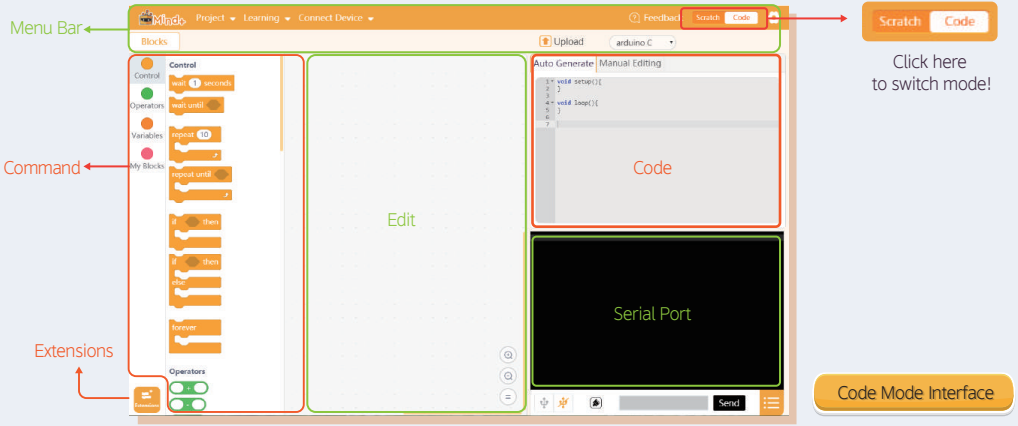
· Click to download: http://www.mindplus.cc
· Install mind+ and open it, the following interface will appear.



Preparation

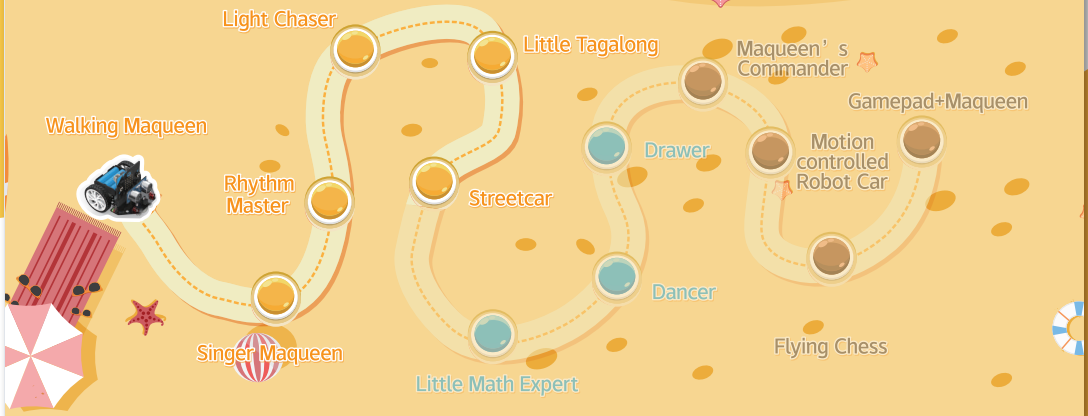
There are two operation modes in mind+: Scratch and Code. Click the icon at the upper-right corner to switch mode.

- In Scratch mode, Maqueen needs connecting computer all long to interact with Mind+.
- In Code mode, once we upload code to Maqueen, he can run programs independently.



Single Player Mode Rules

In this mode, every player needs to accomplish 6 tasks independently.
Players will unlock a piece of basic equipment in each stage.
Command transmission of one-player mode is under the Code mode.



Maqueen Basic Equipment

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Walking Maqueen

Maqueen' s leg and muscle
——wheel and motor

Singer Maqueen

Maqueen' s mouth
——buzzer

Rhythm Master

Maqueen' s leg and muscle
—— wheel and motor

Maqueen' s mouth
——buzzer

Light Chaser

Light Sensitive Sensor

Little Tagalong

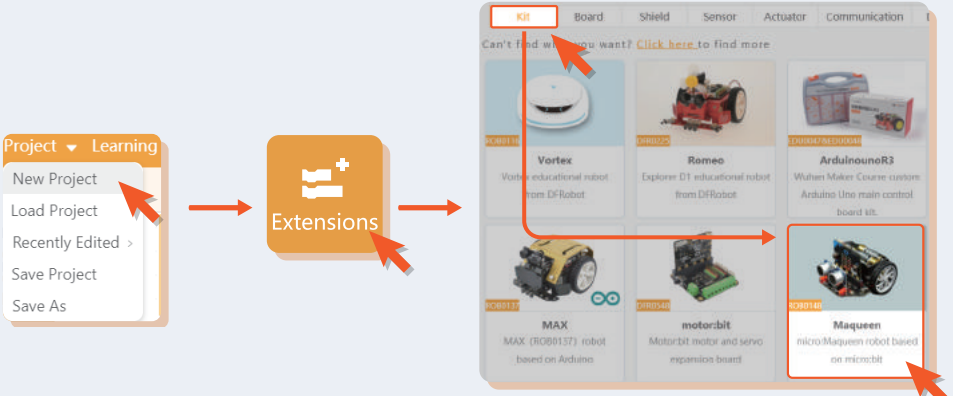
Maqueen' s Eyes
——Ultrasonic

Streetcar

Maqueen' s Eyes
——Grayscale Sensor

Preparation

We need to find the command blocks matched with Maqueen before sending instruction into Maqueen's brain.



1. Click "New Project"

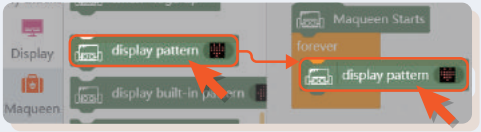
2. Click "Extensions"

3. Click "Kit" -> " Maqueen"

Preparation

Master some basic operations of mind+ to make Maqueen come alive.

Operation1: Drag blocks to the edit section to send orders to Maqueen's brain.



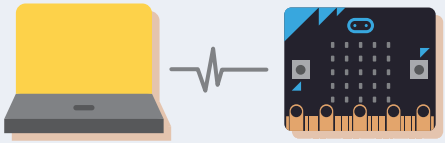
Operation2: Drag the block to the left to remove it, or right-click to delete block.

Preparation

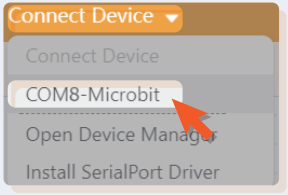
COM24-Microbit

Operation3: Upload the programs we edited to micro:bit as the way shown below.

1.Connect micro:bit to your computer via USB.



2.Connect Maqueen to mind+.

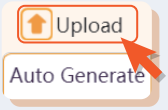


COM8-Microbit

*The Channel's name will be displayed on the menu bar when connected successfully.

*Click "COMXX-Micro:bit" to connect the device.

3. Upload programs to micro: bit

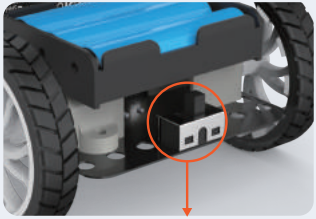


*Click "Upload"

*When the progress bar reaches 100%, the update is done.

4.Wake up Maqueen

*When the command transmitted, turn on the power switch on Maqueen's body to wake up Maqueen.

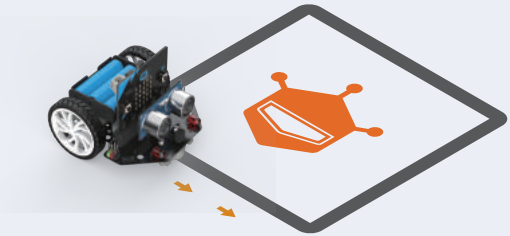


Turn on the power switch

Walking Maqueen

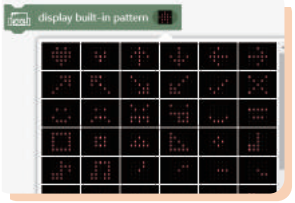
Task:

Let Maqueen walk along a square.

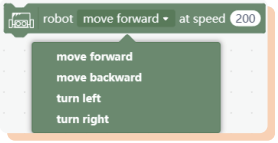


Command Skills:

Display built-in pattern block: select different built-in patterns to turn Maqueen into a living emoji.



Movement control block: control Maqueen's movement in different directions.



Walking Maqueen

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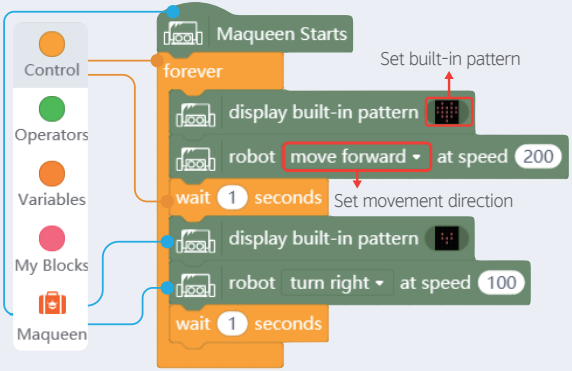
Command Connection



*Hint: let Maqueen move forward and then change direction. Once you adjust the speed and time patiently, you can make it drive along a perfect square.

Hidden Level:

Challenge the hidden level!
Switch to different emojis and revise routine to make Maqueen walk like a catwalk model.

Singer Maqueen

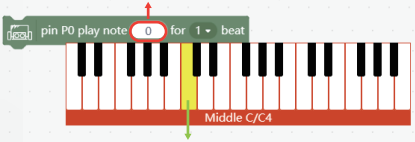
Task:

Make Maqueen sing the song Twinkle, twinkle, little star .

Command Skills:

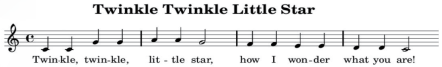
Music Play Command: select different beats and notes and turn Maqueen into a singer.

Click here and you will see a piano keyboard.



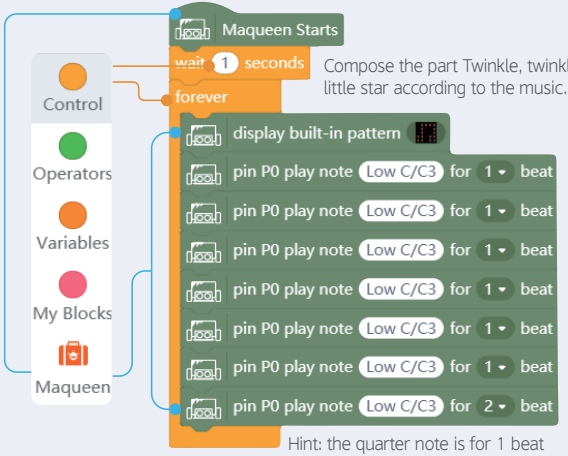
Click the keyboard to choose notes.

The Music Score Twinkle, twinkle, little star



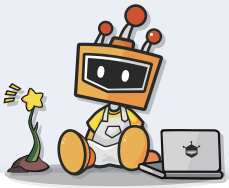
Singer Maqueen

Command Connection



Compose the part Twinkle, twinkle, little star according to the music.

Hint: the quarter note is for 1 beat and the half note is for 2 beats.



Hidden Level:

Challenge the hidden level!
Try different notes and beats, Maqueen can sing all kinds of songs for you!

Rhythm Master

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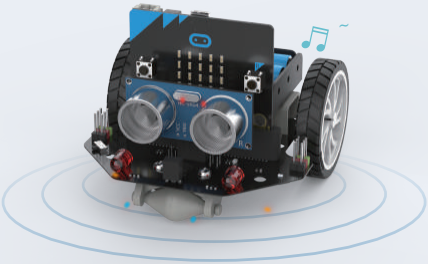
Task:

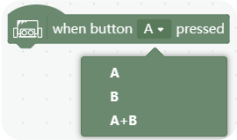
Switch Maqueen among lighting engineer, singer and dancer smoothly.



Command to Light ON.Choose RGB light and color to make Maqueen display various shining effects.

Command Skills:

Button Command:Select different keys to start the programs of Maqueen.



Sound Command: select different sounds to play in Maqueen.

Rhythm Master

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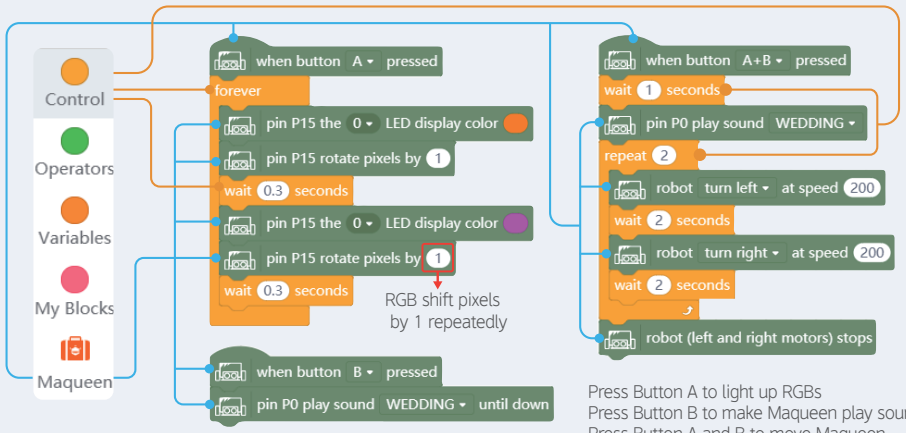
Command Connection



Press Button A to light up RGBs
Press Button B to make Maqueen play sound
Press Button A and B to move Maqueen

Light Chaser

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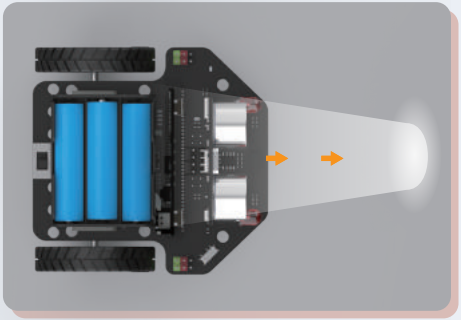
Task

Maqueen likes light very much, let's help him to become a light chaser.



Command Skills

">" Operator: set the intensity range of ambient light

Read Ambient light Command: output the intensity value of ambient light

Light Chaser

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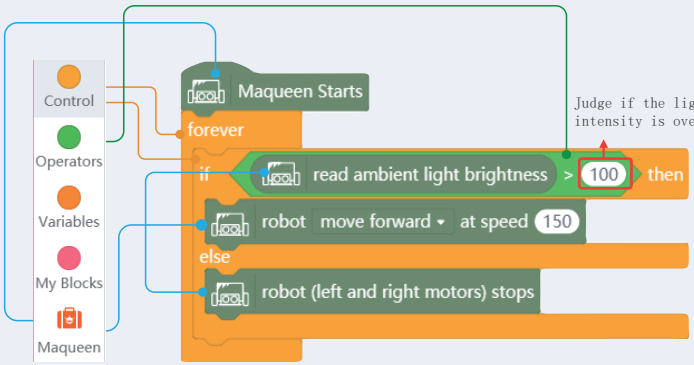
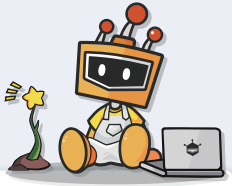
Command Connection





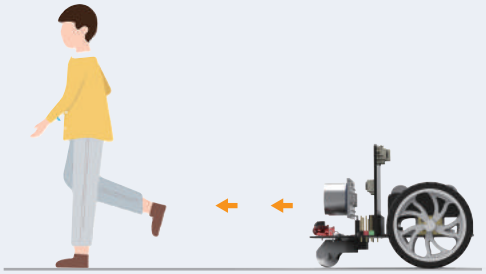
Hidden Level

Challenge the hidden level!
The light chaser will follow light, but what if we turn Maqueen into a light avoiding robot, how to realize that?

Little Tagalong

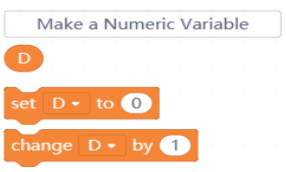
Task

Let Maqueen follow your steps.。

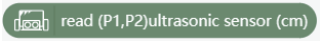


Command Skills:

Variable Command: a box to store data of all kinds (usually, changing data).
Here, the variable is used to store the distance value of ultrasonic.



Read Ultrasonic Value Command: store the distance value the sensor detected.



"and" Operator: only when the left and right conditions are both true, Maqueen can be started.

Little Tagalong

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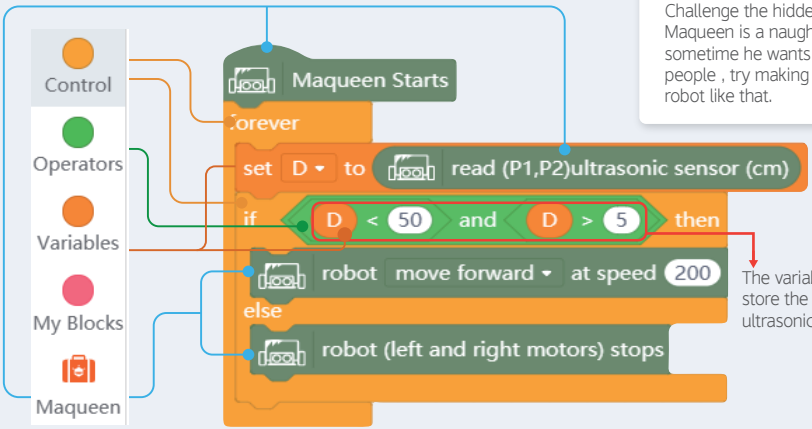
Command Connection



The variable D is used to store the distance value the ultrasonic detected.

Hidden Level:

Challenge the hidden level! Maqueen is a naughty robot, sometime he wants to avoid people , try making a Maqueen robot like that.

Streetcar

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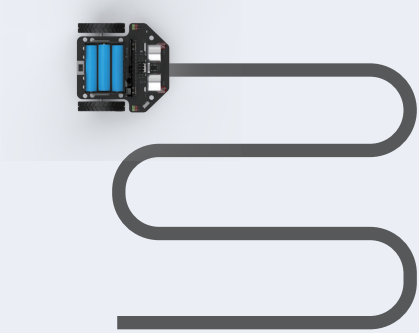
Task:

Let Maqueen drive along the black line, like a streetcar.

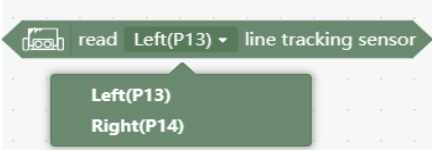


Hint: the black line should be wide enough so that the left and right greyscale sensors can be both on the line.

Command Skills:

"=" Operator: check if the first value is equal to the other value. Here, we use it to judge if the value read by the line-tracking sensor is equal to the given value.

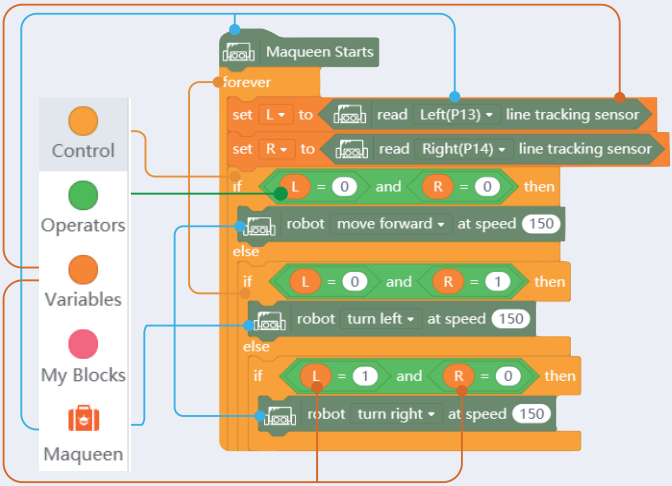
Read grayscale sensor: read the value of the line-tracking sensors, and let Maqueen find the position of the track.



Streetcar

DFROBOT
DRIVE THE FUTURE

Command Connection



Store the value of the left line tracking sensor

Store the value of the right line tracking sensor

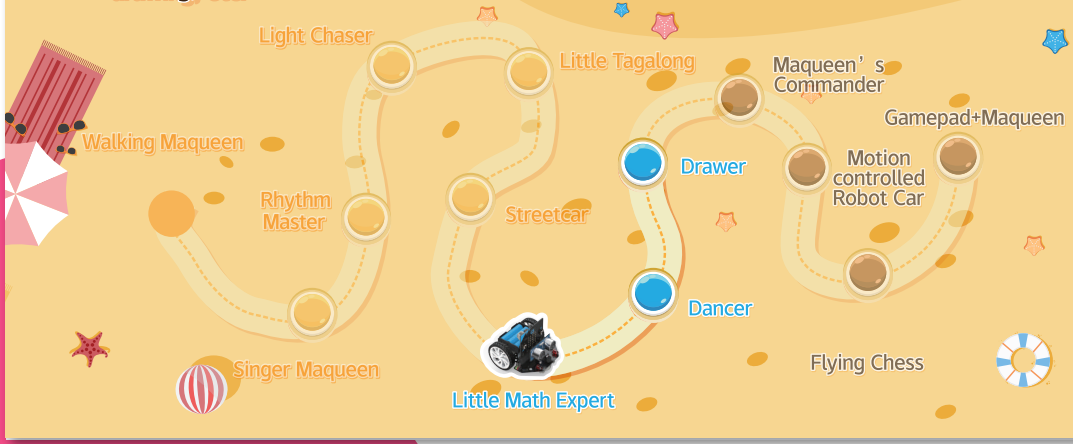
The left and right sensor detected the black line, go straight

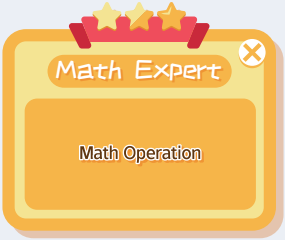
Only the left sensor detected the black line, turn left

Only the right sensor detected the black line, turn right

Interactive Mode Rules

- In this level, Players need to complete 3 tasks under Scratch Mode.
- Use Maqueen’s brain micro:bit to unlock more tools like calculating, drawing, etc.




Math Expert
Math Operation


Dancer
Costumes Switching


Drawer
Drawing

Preparation

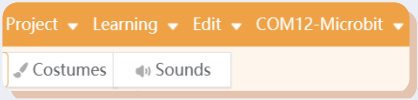
Step 1: Prepare a micro:bit

Unplug the micro:bit from Maqueen. We will only need to use the micro:bit board in interactive mode.

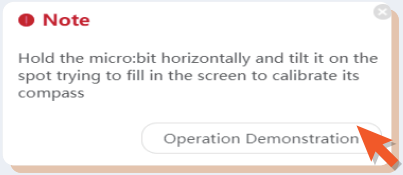
Step 2: Connect micro:bit to mind+

1.Find the blocks related to Maqueen in Extensions of mind+.

2.Click “COMXX-Micro:bit” to Connect micro:bit to computer.



3.When connected, calibrate the compass of micro:bit as the note; click ” Operation Demonstration” to watch the calibration tutorial.



Preparation

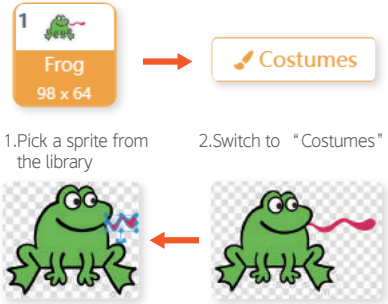
Step 3: Design a sprite

Draw a new sprite

1.Select "Paint" in the sprite library

2.Use tools in toolbar to draw a sprite

Toolbar



1.Pick a sprite from the library

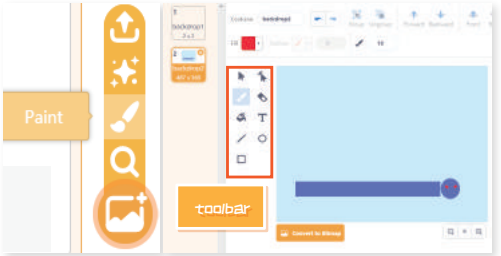
2.Switch to "Costumes"

3.Use the toolbar to revise the sprite

Preparation

Step 4: Stage design

Draw a new background



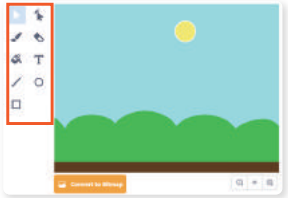
Select “paint” in the background library

Use tools in toolbar to draw background

Revise the existing background

1.Enter background library

2.Pick a background from the library



3.Use toolbar to revise the background

Little Math Expert

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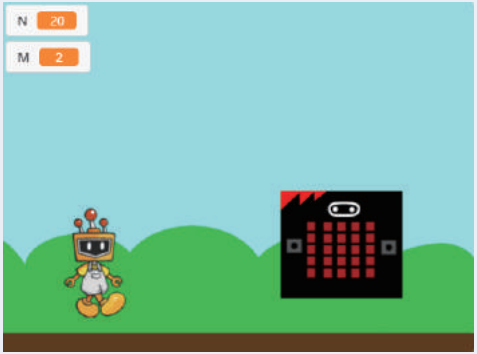
Task:

Calculate: if one is planting trees on a road of N meters at a M meters distance, then how many trees are needed?



Design stage and sprite

1.Choose stage background

Open background library

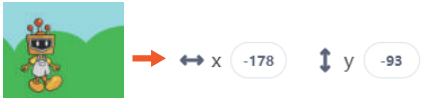
select “blue sky”

2.Choose a sprit

Open sprite library

Select “Mind+”

3. Place “Mind+” to a proper position



1.Drag the sprite to the proper position of the stage

2. Check the sprite’s position on the coordinates here.

Little Math Expert

DFROBOT
DRIVE THE FUTURE

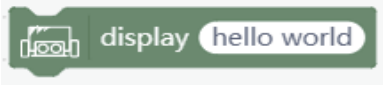
Command Skills:

Event block: scripts that wear this block will activate once the Green Flag has been clicked.

Operators block: solve simple math questions and pave the way for Maqueen to become a math expert.

Say...block: design dialogues for the sprite

Display text block: display number or letter on micro:bit board

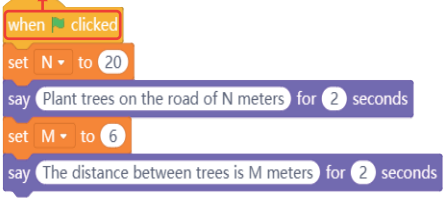


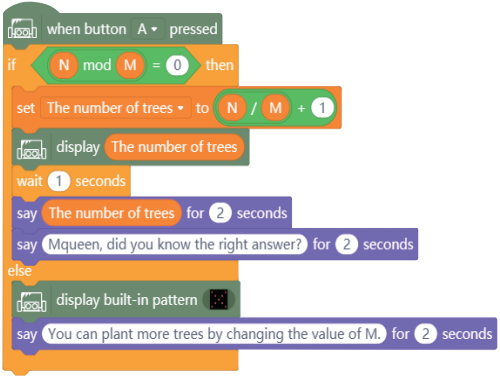
Little Math Expert

Commands for Reference

Set N and M to arbitrary values, when N divided by M gives a reminder of 0, then the correct answer will be obtained, otherwise, revise the value of M to try again.

Click the green flag to start the programs.



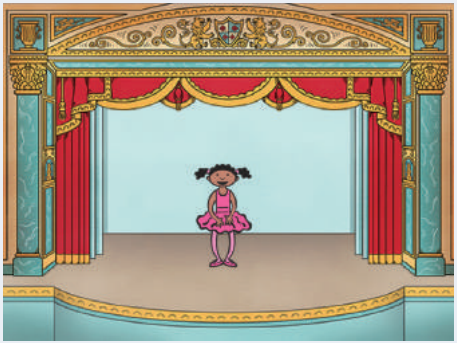


Dancer

DFROBOT
DRIVE THE FUTURE

Task:

Let the ballerina dance under the control of micro:bit!



Design stage and sprite

1.Select stage background

Open background library

Select “Theater”

2.Select sprite

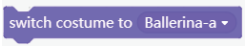
Open sprite library

Select “Ballerina”

Drawer

Command Skills:

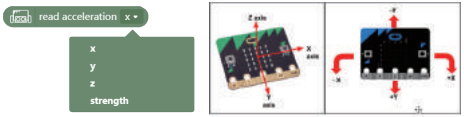
Costumes design block: when there are several costumes for a sprite, use this block to display one of them.



Switch to next costume block: let the sprite switch to next costume

Select a sprite Click Costumes Check all costumes of the sprite

Read acceleration block: read acceleration in the direction of X, Y, Z and the shaking strength

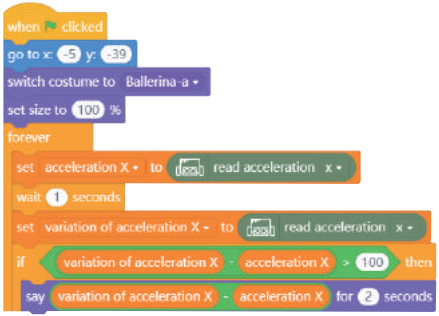


Pick random () to (): pick a number randomly ranging from the first given number to the second.

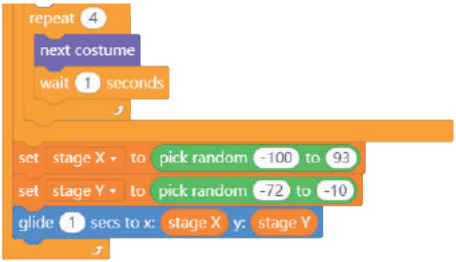
Motion block: move its sprite steadily to the specified X and Y position within given seconds.

Commands for Reference

Read the acceleration variation of micro:bit on X axis at one second intervals. If the variation is over 100, the ballerina starts dancing. Use motion block to let the girl dance on the stage freely.



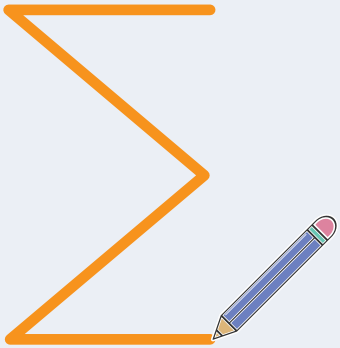
Continuation



Drawer

Task:

Use micro:bit to control the paint in the stage.



Design stage and sprite

1.Select stage background

1.Open background library

Select “blue sky”

2.Select a sprite

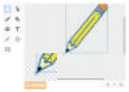
Open sprite library

Select “pencil”
(search by name at the upper-left corner)

3.Revise the center of the sprite “Pencil”

1.Select the sprite pencil

2.Switch to Costumes

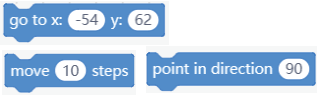


3.Select the pencil, move the pencil tip to the central position

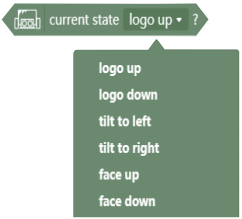
Drawer

Command Skills:

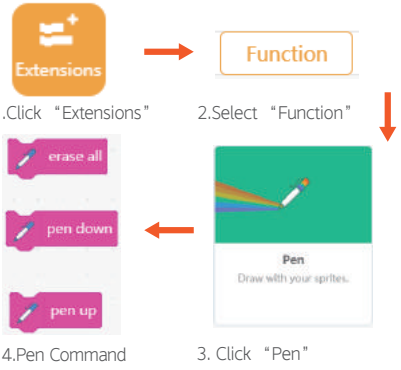
Motion Command: set the sprite’s position and movement.



Gesture Command: set the gesture of micro:bit, and use it to control the state of the pencil and drawing path.



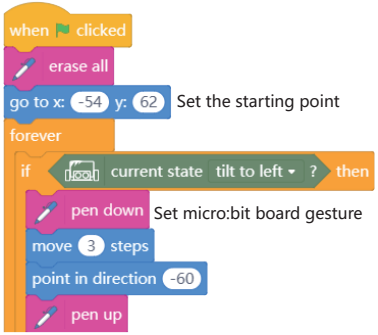
Pen Command: set the state of the pencil; erase all, pen down/up, set the color of the pen, etc.



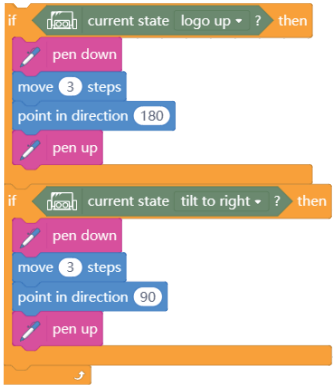
Drawer

Commands for Reference

When micro:bit tilts to left, the pencil draws a oblique line towards the upper left section; when micro:bit tilts to right, the pencil draws a horizontal line towards the right section;when holding micro:bit vertically, the pen draws a downward verti



Continuation



Multiplayer Mode

- Cooperate with your teammates to complete the missions.
- You could utilize external equipment to accomplish all of the tasks.

Light Chaser

Little Tagalong

Maqueen’s Commander

Gamepad+Maqueen

Walking Maqueen

Drawer

Motion controlled Robot Car

Rhythm Master

Streetcar

Dancer

Singer Maqueen

Flying Chess

Little Math Expert

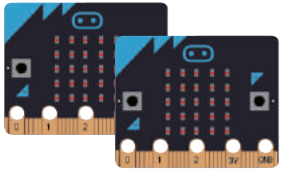
Unlock Extra Equipment

DFROBOT
DRIVE THE FUTURE

Maqueen’s Commander

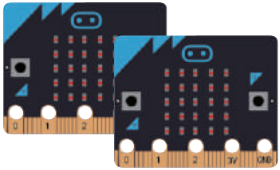
IR Remote Controller

Flying Chess



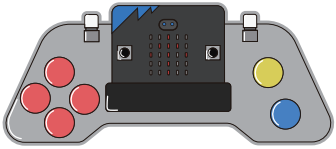
Double Micro:bit Boards

Motion-controlled Robot Car



Double Micro:bit Boards

Remote Control Car



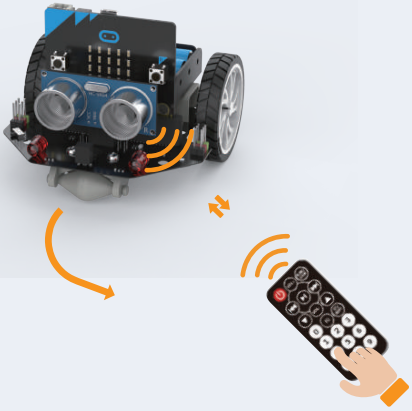
Micro: Gamepad

Maqueen’s Commander

DFROBOT
DRIVE THE FUTURE

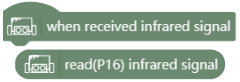
Task:

Use IR Remote controller to control Maqueen’s movement in Code Mode.



Command Skills:

IR Command:



Receive and read the value of IR signal, set push-button to control Maqueen.

Serial Print Command

Serial print is a way to check data in real time. Connect micro:bit to a computer to check the data on serial port, and the connection should not be interrupted.

1.Serial Print “Hello”

2.Upload Programs

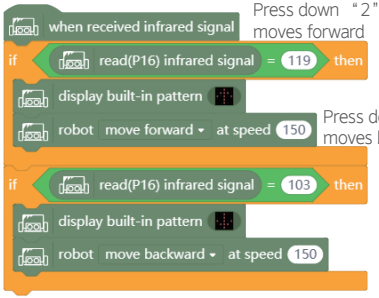
3.Open Serial Port

4.Display Data on Serial Port

Maqueen's Commander

Commands for Reference

Press down button 2,8,4,6,5 to make Maqueen car move forward, move backward, turn left, turn right, and stop.

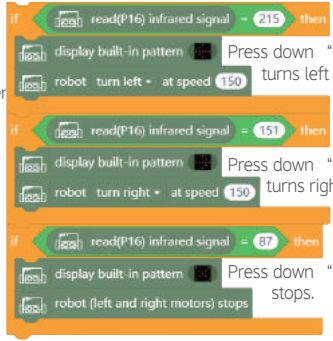


Press down "2", Maqueen moves forward

Press down "8", Maqueen moves backward

*Hint: you must know the key value of the IR remote controller before using it to control Maqueen.
Get the key value through the serial port:
Button 2=119; Button 8=103;
Button 4=215; Button 6=151;
Button 5=87.

Continuation



Press down "4", Maqueen turns left

Press down "6", Maqueen turns right

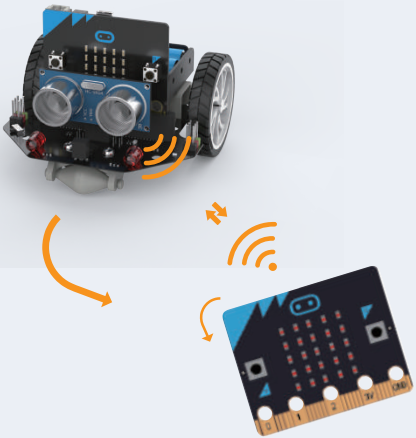
Press down "5", Maqueen stops.

Motion-controlled Robot Car

DFROBOT
DRIVE THE FUTURE

Task:

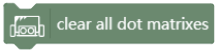
In Code mode, Maqueen turns left and right as the micro:bit tilts to left/right.



Command Skills

Wireless Communication Skills: enable/disable wireless communication; set wireless channel(only when your device is on the same channel, can it receive/transmit data); Let Maqueen moves as your micro:bit says !

Clear Screen Command: initialize LED matrix display.

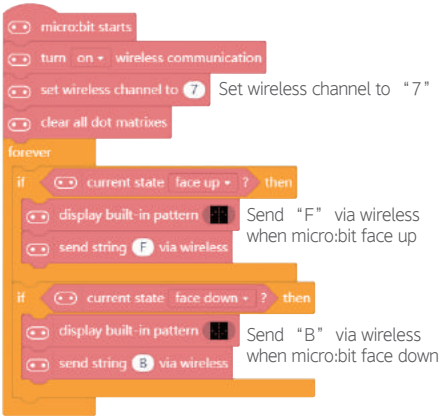


Motion-controlled Robot Car

DFROBOT
DRIVE THE FUTURE

Micro:bit Commands for Reference:

Send information to Maqueen by changing the gesture of micro:bit.



Set wireless channel to "7"

Send "F" via wireless when micro:bit face up

Send "B" via wireless when micro:bit face down

Continuation

Send "L" via wireless when micro:bit tilt to left

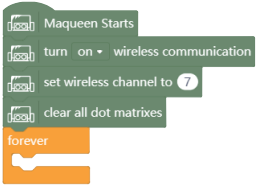
Send "R" via wireless when micro:bit tilt to right

Send "S" via wireless when micro:bit logo up

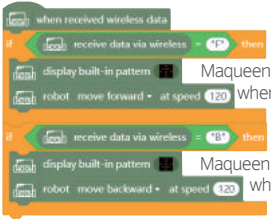
Motion-controlled Robot Car

Commands for Reference:

When Maqueen received the wireless data from micro:bit, he will move forward/ backward or turn left/right as the gesture of micro:bit changes.



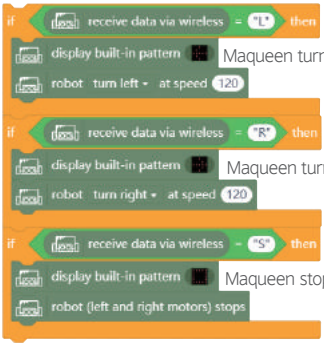
Set wireless channel to "7"



Maqueen moves forward when received "F"

Maqueen moves backward when received "B"

Continuation



Maqueen turns left when received "L"

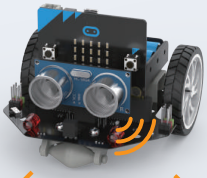
Maqueen turns right when received "R"

Maqueen stops when received "S"

Flying Chess

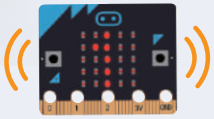
Task:

In Code Mode, let two micro:bit boards communicate with each other. Hold one micro:bit board and shake it, then you get a number, Maqueen will go forward for certain seconds accordingly.



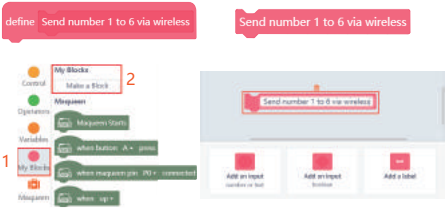
Maqueen go forward for 1s

Get the number "1"

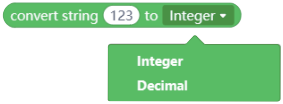


Command Skills

Block Command: define a block to distinguish functions, and make your codes more clear.



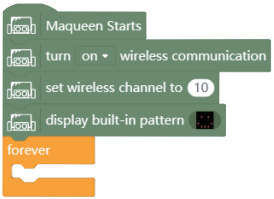
String Transformation:
It can convert string (a type of data) into number. Use this command to transform the received wireless data (string type) to number.



Flying Chess

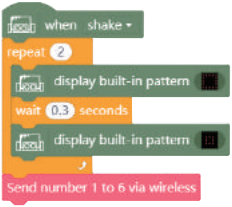
micro:bitMicro:bit Commands for Reference:

Take the micro:bit in your hands as a controller for sending signal. Set the instructions to be sent and shake the micro:bit, then it will transmit a random number between 1 and 6 to Maqueen.



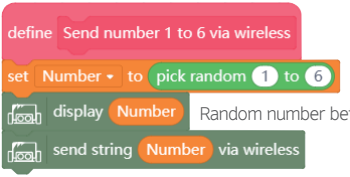
Set wireless channel to "10"

Shake micro:bit board



Call the defined function

Define the function

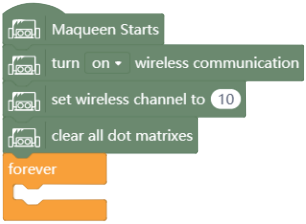


Random number between 1 to 6

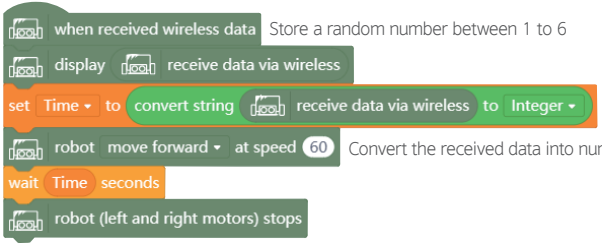
Flying Chess

Commands for Reference:

Maqueen will receive signal from another micro:bit and perform the command. Maqueen advances for certain seconds according to the number it received.



Set wireless channel to "10"



Gamepad + Maqueen

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DRIVE THE FUTURE

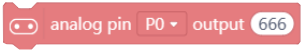
Task:

Use Gamepad to control Maqueen in Code mode.

Command Skills

Read Digital Pin Command: read the digital pins on micro:bit board. Some of the pins are related with button on the gamepad.

Analog Pin Output Command: set the output of analog pin on micro:bit to start the vibration motor.



*Hint: to start the gamepad, you have to find the micro:bit command in Extensions.

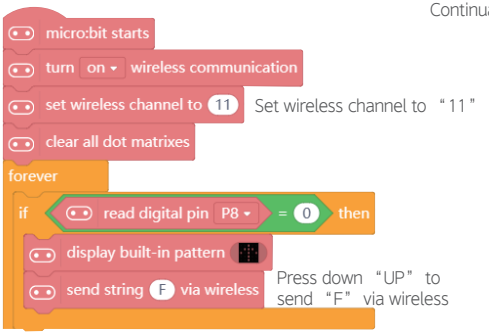
Click "Extensions" Select Board Select micro:bit

Gamepad + Maqueen

Gamepad Commands for Reference:

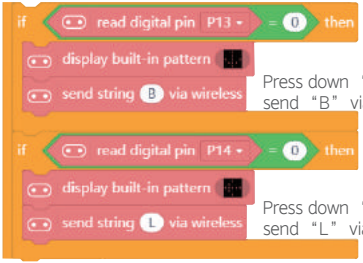
Turn on wireless communication, send signal from Gamepad to Maqueen.
Receive the feedback from Maqueen. If the distance between Maqueen and the obstacle is smaller than 12cm, the vibration motor on the gamepad will be started.

Continuation



Set wireless channel to "11"

Press down "UP" to send "F" via wireless



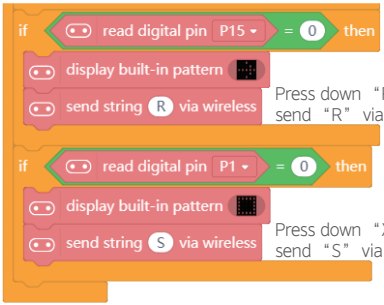
Press down "DOWN" to send "B" via wireless

Press down "LEFT" to send "L" via wireless

Continued on the next page

Gamepad Commands for Reference:

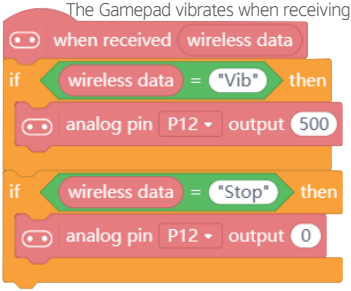
Continued from
the previous page



Press down "RIGHT" to send "R" via wireless

Press down "X" to send "S" via wireless

The Gamepad vibrates when receiving the signal "Vib"

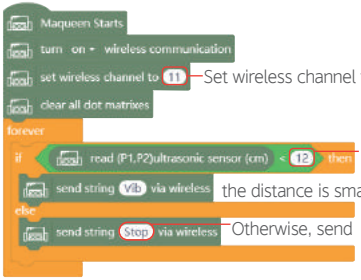


The Gamepad stops vibrating when receiving the signal "STOP"

Gamepad + Maqueen

Maqueen Commands for Reference:

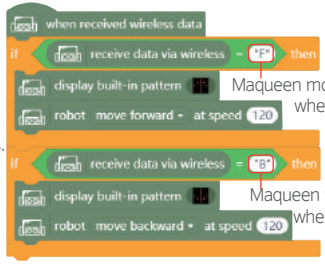
Maqueen moves forward/backward, turn left/right or stop when it received signal from the gamepad.
If there are obstacles ahead, Maqueen will send feedback to the gamepad.



Set wireless channel to "11"

Send "Vib" via wireless. when Maqueen detected the distance is smaller than 12.

Otherwise, send "STOP" via wireless.



Maqueen moves forward when receiving "F"

Maqueen moves backward when receiving "B"

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Gamepad + Maqueen

Maqueen Commands for Reference:

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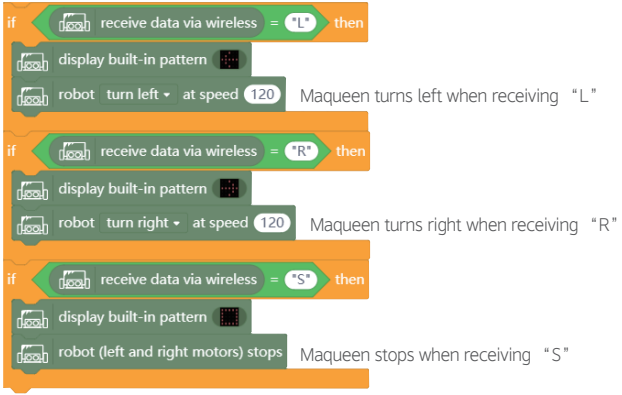

Gamepad + Maqueen

Upload the codes to gamepad and Maqueen, turn on the power switch of Maqueen.
Now you can use gamepad to control Maqueen!
How about designing a complicated track and letting Maqueen drive on it!
Come and challenge now.