



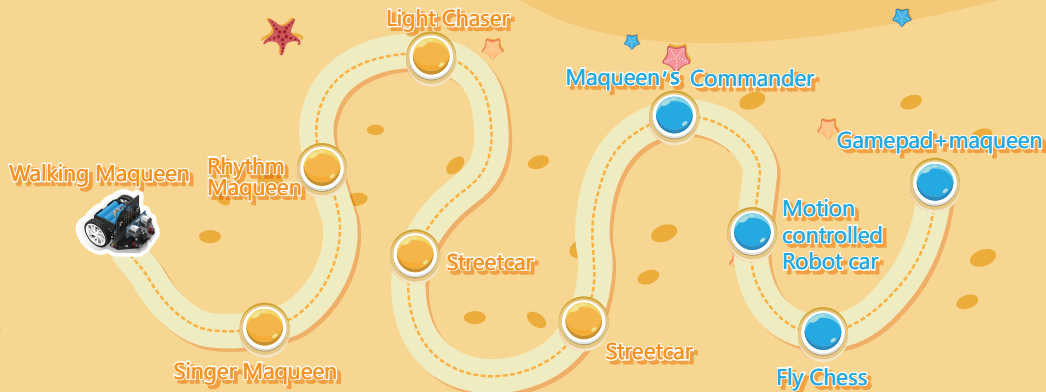
Silly Maqueen



Game Map



There are 2 playing modes for Crazy Maqueen, and each mode includes missions in different levels.
The further you advance, the harder it will be, challenge now!



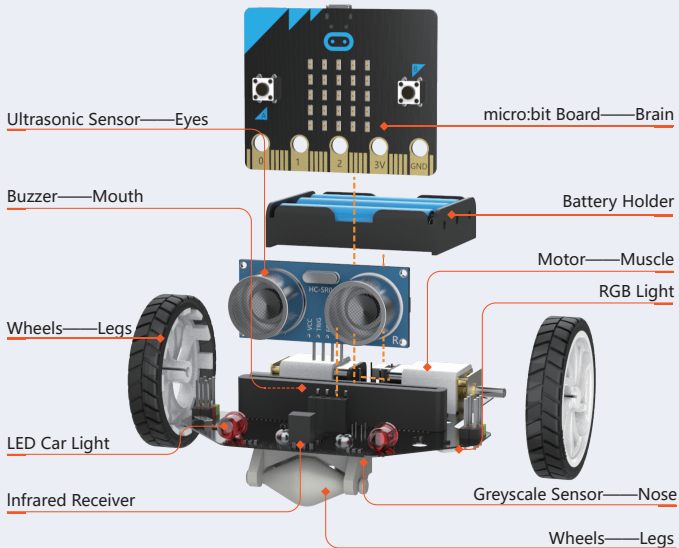
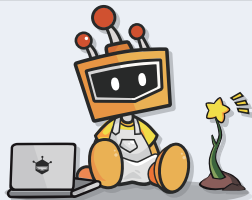


Preparation



DFROBOT
DRIVE THE FUTURE

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



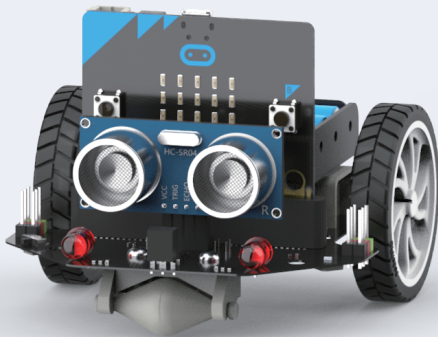
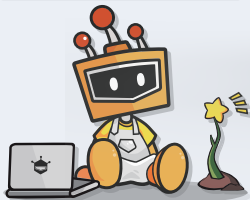


Preparation



DFROBOT®
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WOW! Now Maqueen
is armed to teeth .
Let' s begin!





Preparation

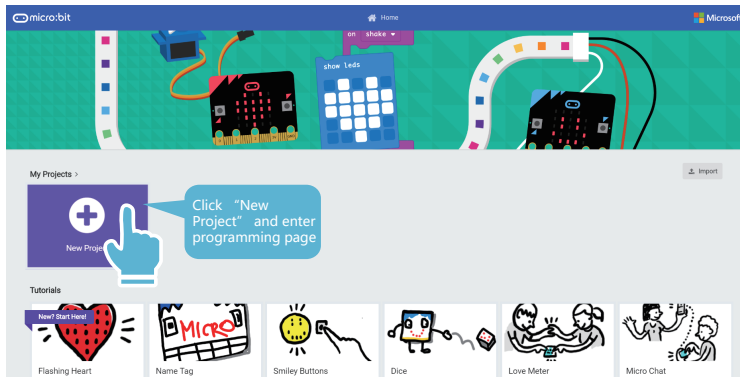


After prepared all equipment in Maqueen, then we can build the programming environment, which is the important command base to set order commands.

Input <https://makecode.microbit.org/> and you can enter Makecode editor.

Note: please login with Internet. If it cannot be loaded, please try install Google explorer.

The initial interface for login





Preparation



Open Makecode editor and create a new project, the interface will show as below.

More

Analog Interface

Editing

Commands

Cool, it is opened, let's get to know the interface.

Pick a name for your project- Save

Download

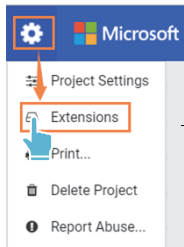
Untitled



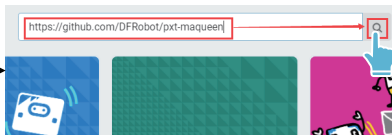
Preparation



Learned basic operation interface of the base, hereafter, we need to find out commands that match Maqueen in extensions.

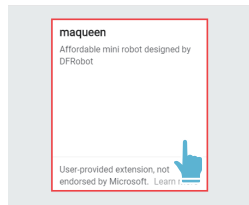


1. Open "More",
click "Extensions"



2. Input `[https://github.com/DFRobot/pxt-maqueen]` in
Search and click to add Maqueen library

https://github.com/DFRobot/pxt-maqueen

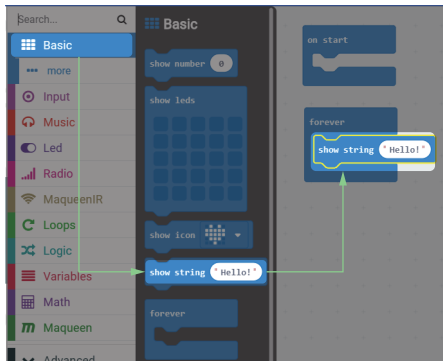


3. Click the result —maqueen

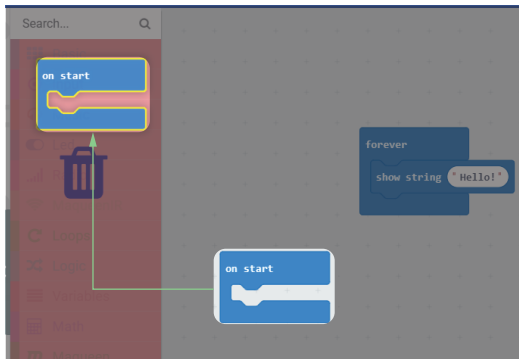


Preparation

Then, come to learn basic method of the base Makecode, which is the key to make Maqueen alive!



1. Drag necessary block to the editing



2. Drag blocks in editing to Commands or click the right button to delete.

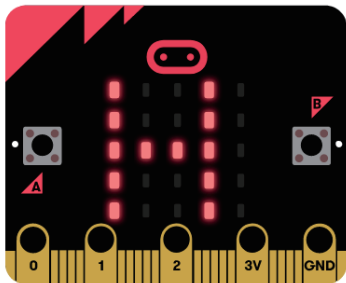


Preparation



DFROBOT®
DRIVE THE FUTURE

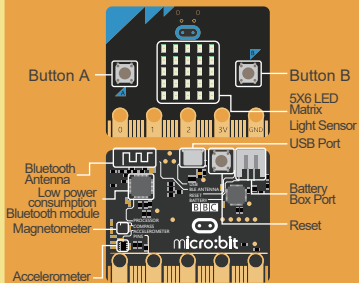
3. Check the program result in the simulator.



- Start/Stop the simulator
- Restart the simulator
- Slow-Mo
- Mute audio
- Launch in fullscreen



★ micro:bit is a pocket-sized microcontroller designed for kids and beginners learning how to program, easy to operate and powerful.



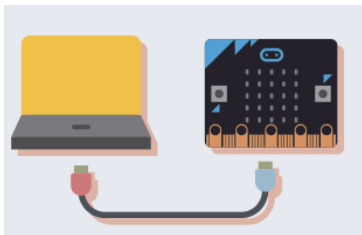


Preparation

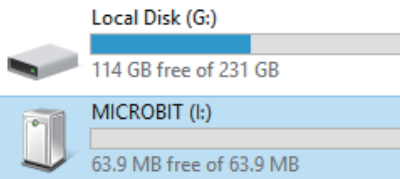


DFROBOT
DRIVE THE FUTURE

4. Upload commands



1. Connect the Maqueen' s brain(micro: bit) to the computer via USB wire



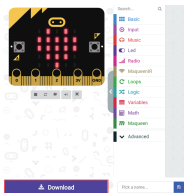
2. If a new hard disk drive shows in "My computer" - "micro:bit" , which suggests a successful connection between Maqueen and computer.



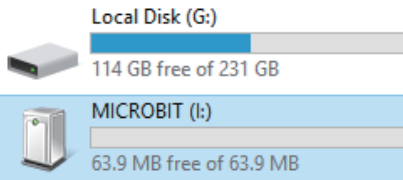
Preparation

4. Upload commands

3. Upload command to the brain of Maqueen

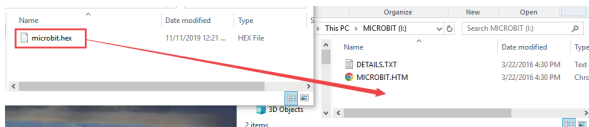


Click "Download"



Select and save file in the dialog box pops up to micro:bit, as shown below: H:\

Here is the other way to upload command. You can copy the .hex file and paste to MICROBIT disk.



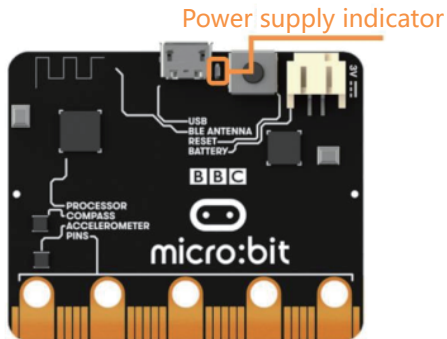
NOTE: the indicator in the back of micro: bit will keep flashing in burning, please do not disconnect the power supply.



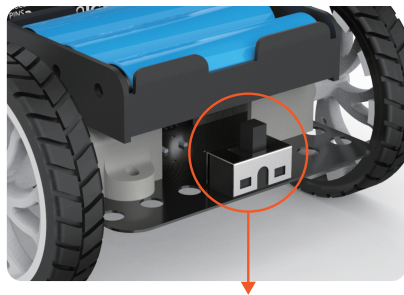
Preparation

5. Upload commands

3. Start Maqueen



The indicator stops flashing when the command transportation ends.



Turn ON the switch in Maqueen

Switch ON to wake up Maqueen when the command transportation ends.

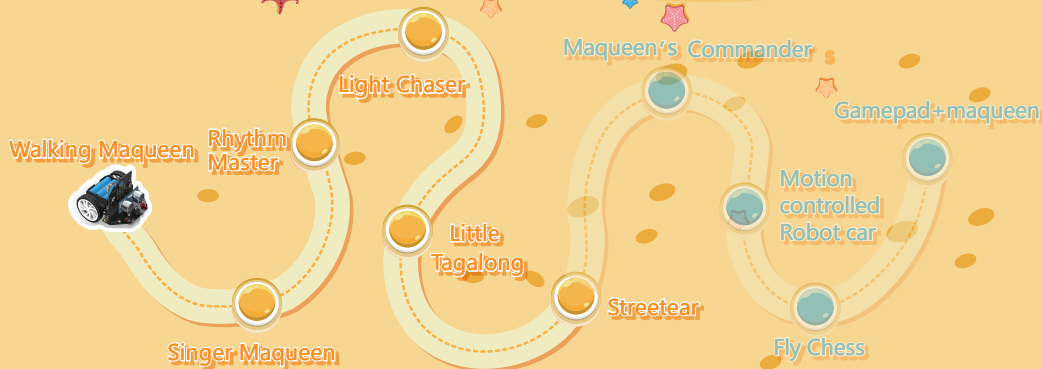


Game Map



DFROBOT®
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- Unlock all basic equipment in Maqueen.
- Take advantages of equipment to finish task in different levels.
- Be familiar with Makecode editor and its commands.





Single Player Mode Rules



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Walking Maqueen



Maqueen do the special

Singer Maqueen



Play Twinkle,
twinkle, little star is
so easy

Rhythm Master



Show Maqueen' s
talent in dancing
and music



Light Chasera



Make Maqueen a
light chaser

Little Tagalong



Maqueen, the most
faithful friend

Streetcar



Maqueen can follow
black wire to find the
direction to proceed.



Walking Maqueen



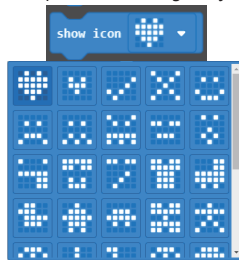
☆))) Task:

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



Search...

Basic

Input

Music

Led

Radio

MaqueenIR

Loops

Logic

Variables

Math

Maqueen

forever

show icon

Motor M1 dir CW speed 200

Motor M2 dir CW speed 200

pause (ms) 1000

show icon

Motor M1 dir CW speed 100

Motor M2 dir CW speed 0

pause (ms) 500

Set display image

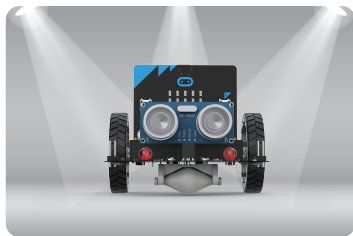
Set movement

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



Hidden Level:

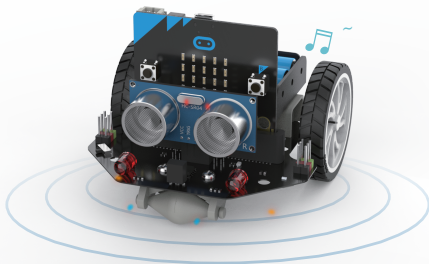
Challenge the hidden level!
Switch to different emojis and revise routine to make Maqueen walk like a catwalk model.



Singer Maqueen

★))) Task:

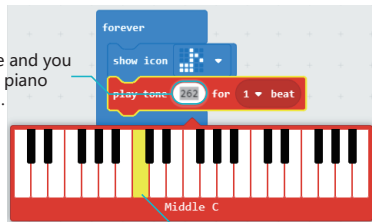
Make Maqueen sing the song Twinkle, twinkle, little star.



★))) 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.

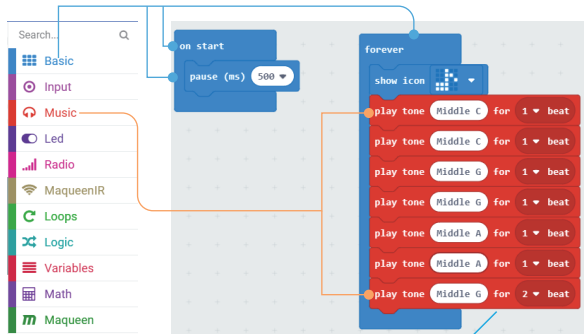


Click the keyboard to choose notes.

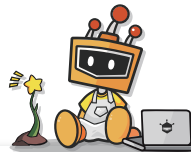
The Music Score Twinkle, twinkle, little star



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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DRIVE THE FUTURE

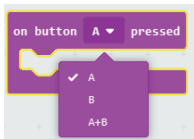
Task:

Switch Maqueen among lighting engineer, singer and dancer smoothly.

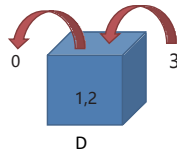
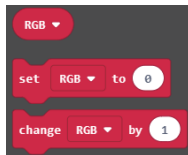


Command Skills:

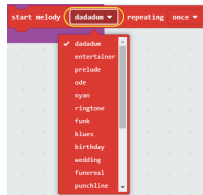
Select different keys to start the programs of Maqueen.



Variable Command: a box to store data of all kinds (usually, changing data). Here, the variable represents 4 RGBs(0, 1, 2, 3) in Maqueen.



Sound Command: select different sounds to play in Maqueen.



☆))) Command Skills :

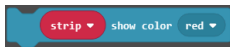
Command to set RGB pins: select related pins and number to light ON.



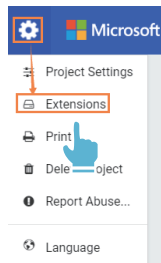
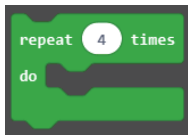
Select pin No. 15

Set RGB No. 4

RGB Color Command: choose RGB color to make Maqueen display various shining effects.

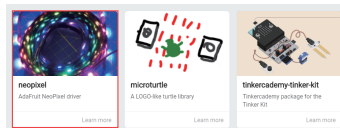


Repeat until: set times to execute a set of program. E.g. Flash RGB for 4 times and turns off.



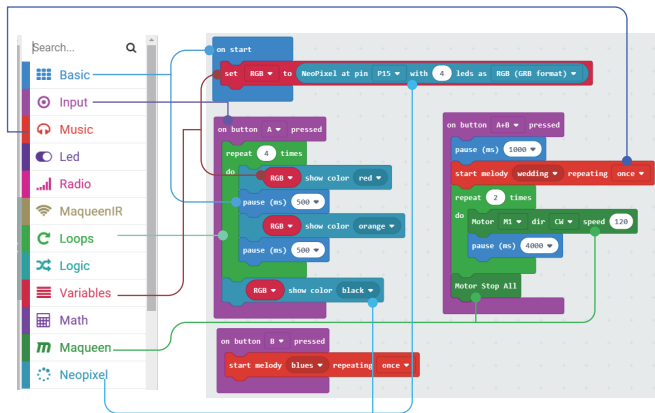
Hint: RGB belt command should be added in extensions.

Click "More..." and select "Extensions"



Click "neopixel" and add RGB belt

Rhythm Master



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



Hidden Level:

Challenge the hidden level!
When light up RGB, Maqueen
looks so cool. It must be fantastic
to use RGB belt command make a
flowing water lamp effect!



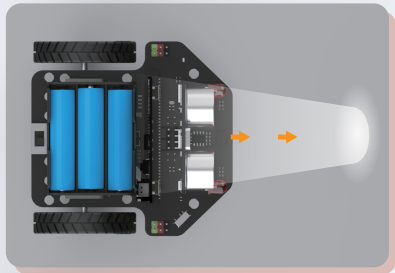
Light Chaser



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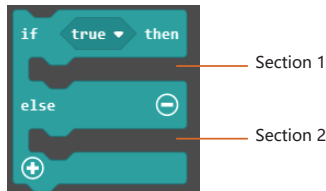
☆))) Task:

Maqueen likes light very much, □
let' s make it a light chaser.

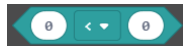


☆))) Command Skills:

Condition judgement command(if...then...else...): execute the 1st section if it satisfies the condition, otherwise execute the 2nd section. In this program, this is used to judge the environment light strength. If it satisfies the condition(fixed environmental light value), Maqueen can be moved, otherwise it keeps static.



Comparison: to compare 2 values as a condition to judge.



Brightness: store ambient light value.

light level



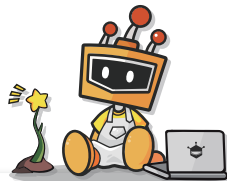
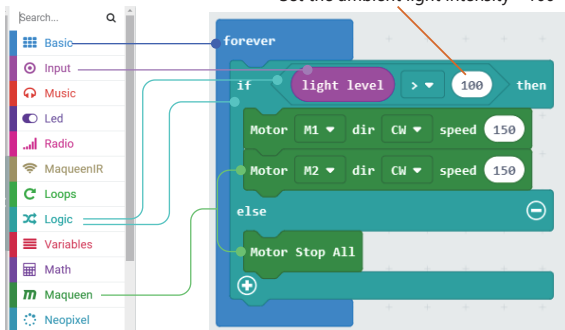
Light Chaser



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DRIVE THE FUTURE

Move if the light intensity is over 100, otherwise keep static. The light intensity is adjustable according to the environment.

Set the ambient light intensity > 100



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?



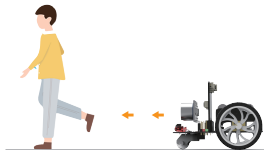
Little Tagalong



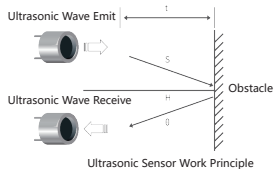
DFROBOT®
DRIVE THE FUTURE

★))) Task

let Maqueen follow your steps.

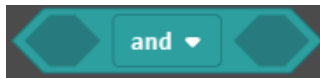


To begin with, let's get to know the eyes of Maqueen—the principle of ultrasonic wave

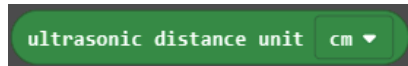


★))) Command Skills :

AND: only two conditions are satisfied at the same time can drive Maqueen.



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



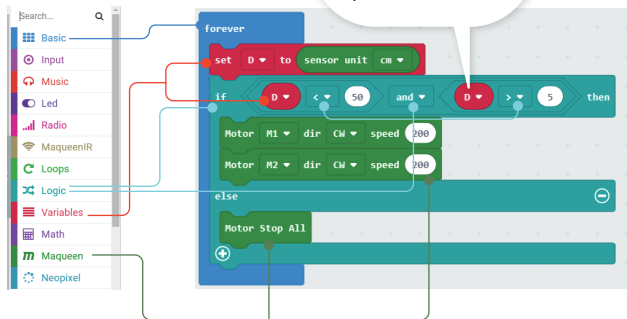


Little Tagalong

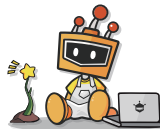


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DRIVE THE FUTURE

If the distance between Maqueen and the obstacle is within 5~50, Maqueen will move on, otherwise keeps static.



Upload command to Maqueen.
Unplug the USB serial wire, let's
play outside.



Hidden Level:

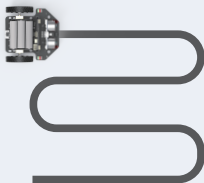
Challenge the hidden level!
Maqueen is a naughty robot,
sometime he wants to avoid
people, try making a Maqueen
robot like that.



Streetcar

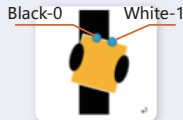
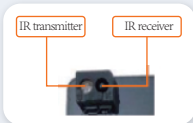
★))) Task:

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



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

To begin with, let's get to know the output value when the ultrasonic sensor detects white and black: Black-0, White-1.



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★))) Command Skills:

"=" **Equation:** store the right value of the equation to the left variable.



Condition Judge (If...then...): execute block contained in the section if the condition is satisfied. In the program, it is always used to judge whether black wire is detected.



Grayscale Sensor: set the output value of the line-tracking sensors





Streetcar



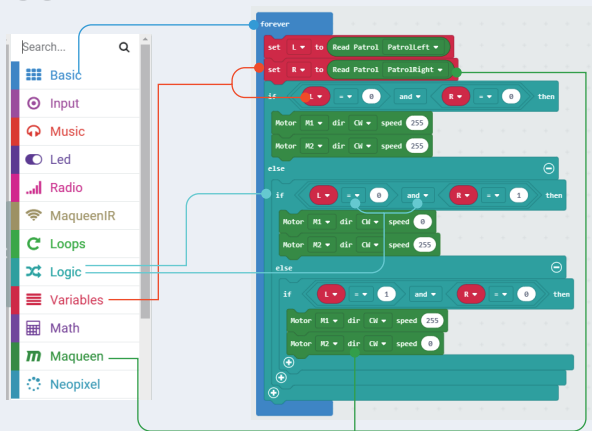
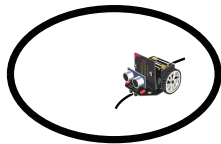
DFROBOT[®]
DRIVE THE FUTURE

Upload command to Maqueen.
Unplug the USB serial wire, let's
play outside.



Hidden Level:

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



The left and right sensor detected the black line, go straight.
If the left sensor detected the black line, turn left. If the right sensor
detected the black line, turn right.
Take care of high speed and avoid rushing out of the street.



Multiplayer Mode

- Unlock the external equipment
- Accomplish the task with the help of the external equipment

Maqueen's Commander

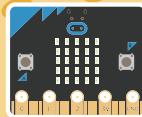


Gamepad+maqueen

Motion
controlled
Robot car

Fly Chess

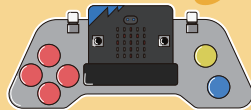
External equipment in need



micro:bit



IR Remote Controller



Micro: Gamepad



Multiplayer Mode



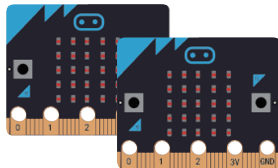
Maqueen' s Commander



IR Remote Controller



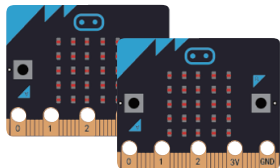
Flying Chess



Double Micro:bit Boards



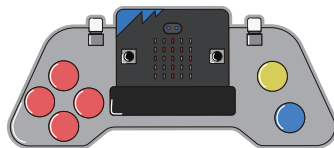
Motion-controlled Robot Car



Double Micro:bit Boards



Remote control car with Micro: Gamepad



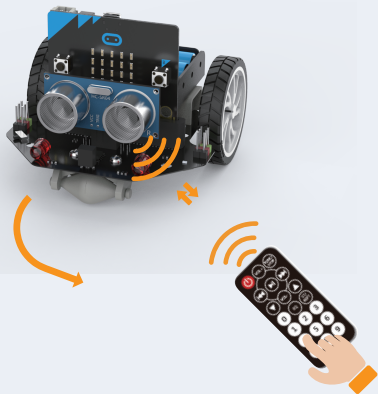
Micro:Gamepad



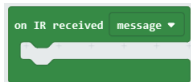
Maqueen' s Commander

★))) Task:

control Maqueen move forward and move back with IR controller

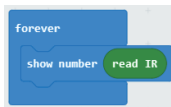


IR Command:



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

Show string:



Note: we need to know the button value before using Maqueen control Maqueen.

Use show number module to read button value of the IR controller

Key2=17, Key 8=25,

Key 4=20, Key 6=22

Key5=21

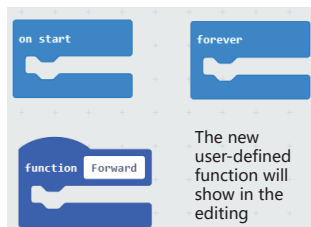


Maqueen's Commander

Command Skills: make a new function doSomething to distinguish functions and makes the code more clearly.



make a new function

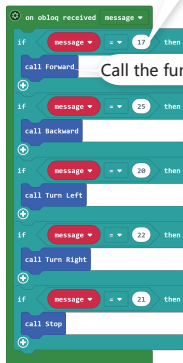


Find the new function in Functions.



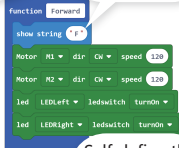
Maqueen's Commander

Press button "2" to move forward.
Press button "8" to move back.
Press button "4" to turn left.
Press button "6" to turn right.
Press button "5" to stop.

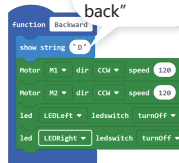


Call the function

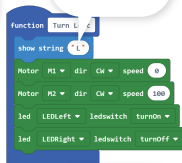
Self-define the function "Move forward"



Self-define the function "move back"



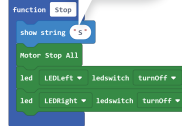
Self-define the function "to"



Self-define the function "turn right"



Self-define the function "stop"

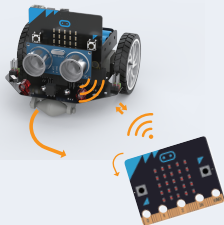




Motion-controlled Robot Car

★))) Task:

Maqueen turns left and right as the micro:bit tilts to left/right.



Note: please prepare the other micro: bit to challenge this level.

★))) Command Skills:

String Command: you can store string form in the space as below,
Such as F,B,L,R...



Wireless Setting Command: only micro: bit and Maqueen in a same channel, can they communicate.

radio set group 1

Wireless Data Sending(string): micro:bit send strings to Maqueen with wireless communication. Such as F, B, L, R...

radio send string

Wireless Data Receiving(string): Maqueen receive data from Maqueen with wireless communication.

on radio received receivedString

Micro: bit Gesture Command: 11 types at all, you can control Maqueen to move by these gesture commands.



Click the pull-down arrow to select different gesture

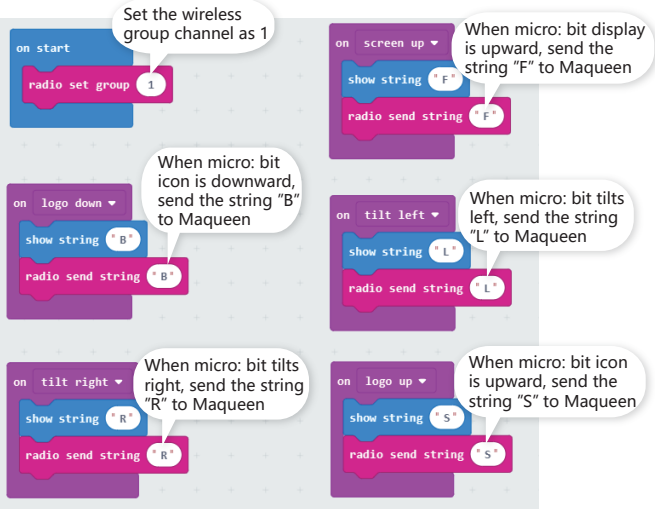


Motion-controlled Robot Car

Examples:

Change micro: bit gestures to send different data to Maqueen.

Micro: bit Send





Motion-controlled Robot Car

Maqueen Receive

When Maqueen receives data from micro: bit, it moves forward and back according to the states of micro: bit .

Set the wireless channel as "1" in accordance with the channel to send data.

on start
radio set group 1

NOTE
The "receivedString" here is the same as the variable "receivedString" as below.a

When Maqueen feels micro: bit is upward and receives the wireless data "F", it starts moving forward.

When Maqueen feels micro: bit is downward and receives the wireless data "B", it starts moving back.

When Maqueen feels micro: bit tilts left and receives the wireless data "L", it starts turning left.

When Maqueen feels micro: bit tilts right and receives the wireless data "R", it starts turning right.

When Maqueen feels micro: bit is upward and receives the wireless data "S", it stops moving.

```
on radio received receivedString
if receivedString == "F" then
  Motor M1 dir CW speed 120
  Motor M2 dir CW speed 120
+
if receivedString == "B" then
  Motor M1 dir CCW speed 120
  Motor M2 dir CCW speed 120
+
if receivedString == "L" then
  Motor M1 dir CW speed 0
  Motor M2 dir CW speed 120
+
if receivedString == "R" then
  Motor M1 dir CW speed 120
  Motor M2 dir CW speed 0
+
if receivedString == "S" then
  Motor stop M1
  Motor stop M2
```



Flying Chess

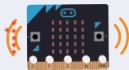
☆))) Task:

Shake micro: bit and get one number. The number suggests the steps that Maqueen move forward.



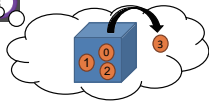
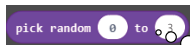
Move forward
for 1 steps

Shake the number to 1



☆))) Command Skills:

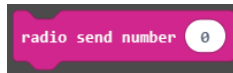
Random Command: return one number between 0~N.
E.g. There are 4 number(0~4)in the box, then we take one from them, and the number that we took out is a random number within 0~3.



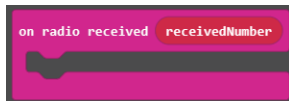
Arithmetic Operator: multiplication, to get the product of numbers or variables.



Wireless Number Sending: send numbers to Maqueen via wireless communication, such as 1,2,3,4...



Wireless Data Receiving(number): Maqueen receives data from micro: bit wirelessly.





Flying Chess

Flying Chess
micro:bit send

on start

radio set group 2

on shake ▼

repeat 2 times

do
show icon 

pause (ms) 50 ▼

show icon 

call Send a wireless signal

function Send a wireless signal

set number ▼ to pick random 1 to 6

show number number ▼

radio send number number ▼



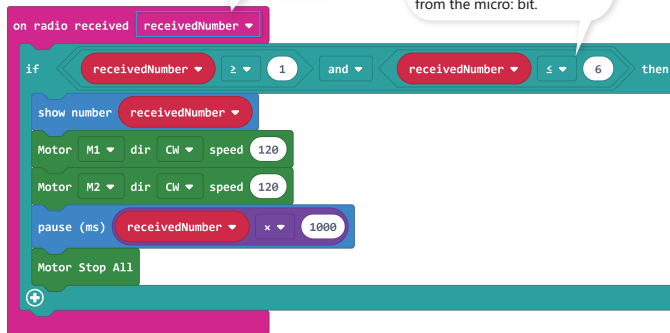
Flying Chess

Flying Chess Maqueen receive



NOTE
The "receivedString" here is
the same as the variable
"receivedString" as below.

The number of the steps that
Maqueen moves forward is the
same as the number received
from the micro: bit.





Flying Chess

Upload command to micro: bit and Maqueen



Download

Download to device

Upload the commands to receive and send separately to micro: bit and Maqueen.
And put groups of Maqueen to race at the runway, who will be the winner?

Let's
run!





Gamepad + Maqueen

★))) Task:

control Maqueen with micro: gamepad, just the same as we did before to add Maqueen.



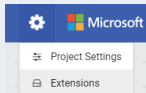
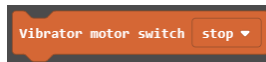
Note: please add extensions of micro:gamepad

★))) Command Skills:

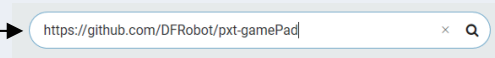
Button Command: Once a button is pressed, Maqueen will execute the corresponding function.



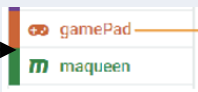
Motor vibrate command: to enable motor start or stop vibration.



1、Click Extensions



2、Input the link: 【 <https://github.com/DFRobot/pxt-gamePad> 】 and click to search, and add gamepad library.



3. The Command will show gamePad when add it successfully.



Gamepad + Maqueen

Remote-control car Gamepad send

Open wireless communication, gamepad send data to Maqueen and receive feedback from Maqueen. If the distance between Maqueen and obstacle is within 12cm, gamepad will vibrate to inform until the distance > 12cm.

```
on start
  show icon [Maqueen icon]
  radio set group 3
```

```
on button D-PAD down is pressed
  radio send string "DOWN"
  show string "D"
```

```
on button D-PAD right is pressed
  radio send string "RIGHT"
  show string "R"
```

```
on button X button is pressed
  radio send string "STOP"
  show string "S"
```

```
on button D-PAD up is pressed
  radio send string "UP"
  show string "U"
```

```
on button D-PAD left is pressed
  radio send string "LEFT"
  show string "L"
```

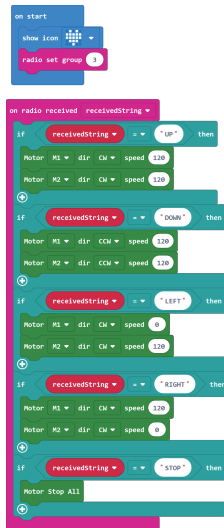
```
on radio received receivedString
  if receivedString == "Vib" then
    Vibrator motor switch Vibration
  +
  if receivedString == "Stop" then
    Vibrator motor switch stop
  +
```



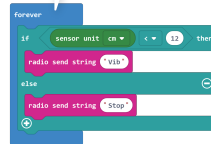
Gamepad + Maqueen

Remote-control car Maqueen receive

Once Maqueen receives data from micro: gamepad, it starts execute functions such as **move forward**, **move back**, **turn left**, **turn right** and **stop**. If it encounters obstacles ahead, it will send feedback data to micro: gamepad.



If Maqueen detects obstacles within 12cm, it will send "Vib" to gamepad, if it is more than 12cm, it will sand string "Stop".





Gamepad + Maqueen

Upload command to micro: gamepad and Maqueen



Download

Download to device

Upload command to micro: gamepad and Maqueen, switch ON, try finishing challenges as below.



Children can DIY a racetrack and make groups to challenge the game “Blindfolded Control Maqueen”, and check which group will reach the terminal firstly.

Challenge Rule: the challenger should be blindfolded, and control Maqueen with micro: gamepad according to the command from the partner, the first one reaches to the terminal is the winner.