Car tracking
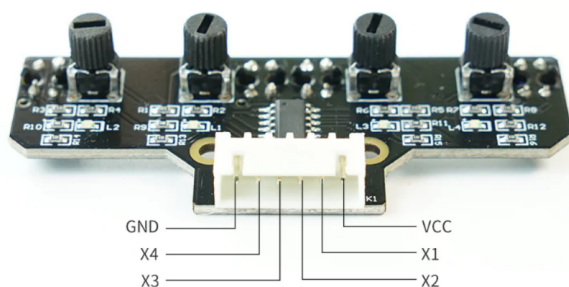
The tutorial demonstrates how to use Micro:bit to control the car to track.

```
Users need to purchase an expansion board that can drive the motor or a Micro:bit
robot car for experimental demonstration
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Four-way tracking module

Hardware wiring

The four-way line patrol module and the car or expansion board can be connected using Dupont wires, just follow the table to connect!

```
The Micro:bit robot car and expansion board do not have a fixed position and
dedicated interface for the four-way tracking module, so you need to fix and
connect it yourself
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Four-way line patrol module interface	Four-way line patrol module corresponding indicator light	Four-way line patrol module corresponding knob	micro:bit
VCC			5V
X1	L1	SW1	P4
X2	L2	SW2	P5

Four-way line patrol module interface	Four-way line patrol module corresponding indicator light	Four-way line patrol module corresponding knob	micro:bit
X3	L3	SW3	P7
X4	L4	SW4	P10
GND			GND

Working principle

Car status analysis: By reading the high and low levels of X1, X2, X3, and X4, it is determined whether the four-way line patrol module sensor detects a black line.

- Four-way tracking module

Black line detected:

Light on Four-way line tracking module corresponding interface outputs low level

White line detected:

Light off Four-way line tracking module corresponding interface outputs high level

- Car control

Control the motor forward and reverse through PWM, no more introduction here!

> Generally, the expansion board or the corresponding product of the car will be packaged with the corresponding expansion package, just drag and drop the code block!

Main code

The idea of controlling the car can be directly understood and analyzed from the car code!

Basic version - Tracking
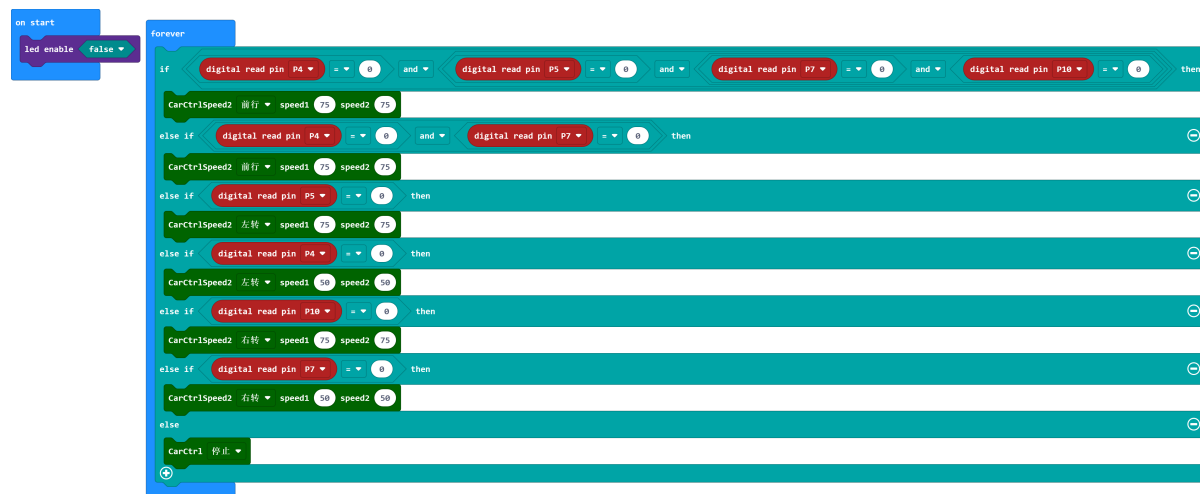
Advanced version - Tracking

Description

Compared with the basic version, the advanced version adds a feature that keeps the previous car moving for 2 seconds if the black line is not recognized, and pauses if the black line is still not recognized after 2 seconds. This can prevent the car from stopping due to some unrecognized situations.

Experimental phenomenon

After downloading the program, turn on the car or the external power supply of the expansion board, and place the car on the patrol map to track!

The patrol map is not specified, and users can make it by themselves.

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The patrol effect video of the advanced version is recorded in the course folder
for reference only!
```

Notes

- Adjustment of the four-way tracking module

If the four-way tracking module is not sensitive or cannot be recognized, you can only connect VCC and GND, and place the four-way tracking module on a black and white background to adjust the knob.

Final effect: The indicator light of the four-way tracking module is on when it is 1.5cm away from the black background, and the indicator light is off when it is 1.5cm away from the white background (referred to as black on and white off).

- Code development issues

Since some pins of Micro:bit are multiplexing functions instead of GPIO functions by default, we need to turn off the default multiplexing function of the pins before we can use the GPIO (general input and output) function.

> If users use their own or other manufacturers' products, they need to consider this issue for development and debugging, whether there is a pin occupation or multiplexing problem!

- Car debugging

The actual line patrol effect of the car is related to the car speed and the sensitivity of the four-way line patrol module. Users can debug according to this.