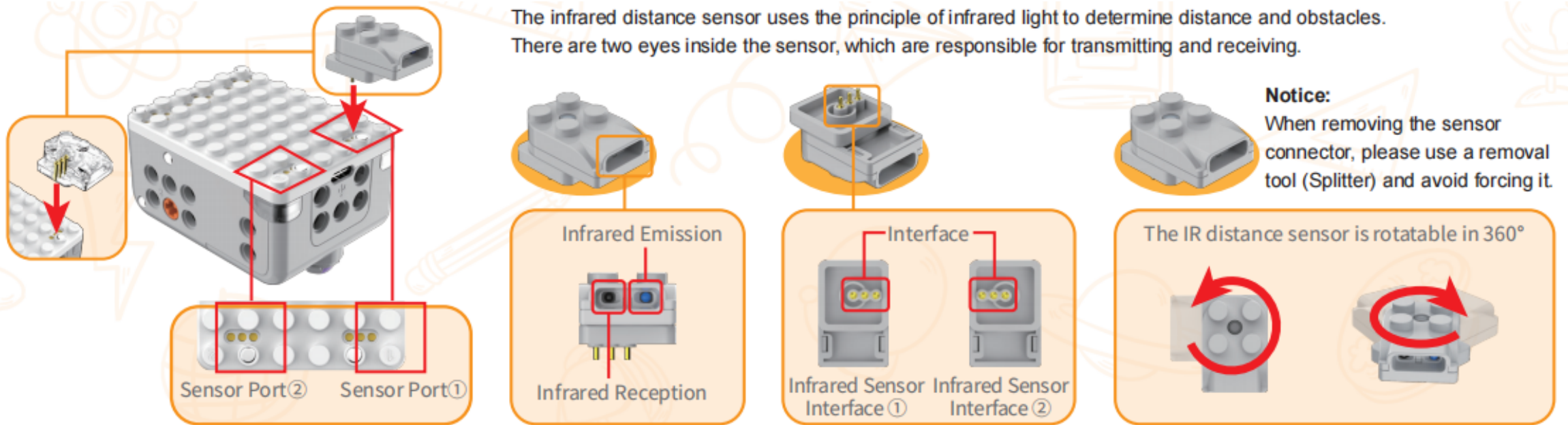




Course Review

1. The infrared distance sensor

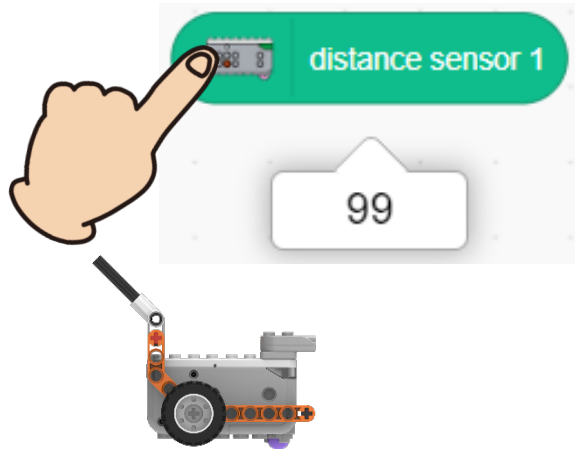
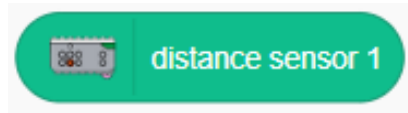
The infrared distance sensor uses the principle of infrared light to determine the distance to an obstacle. The sensor has two small "eyes" or parts: one for emitting the infrared light and the other for receiving it.



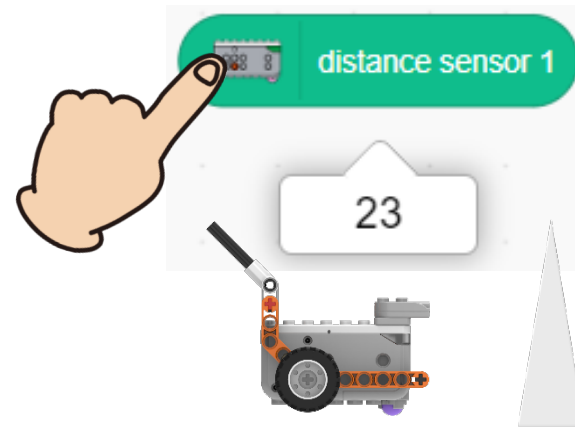


Course Review

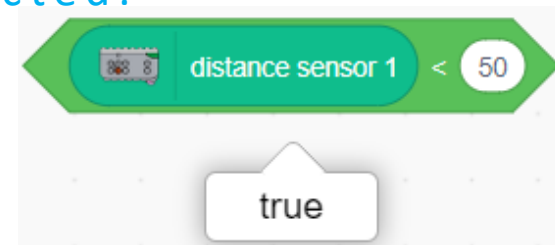
2. Module Explanation



When no obstacles are detected



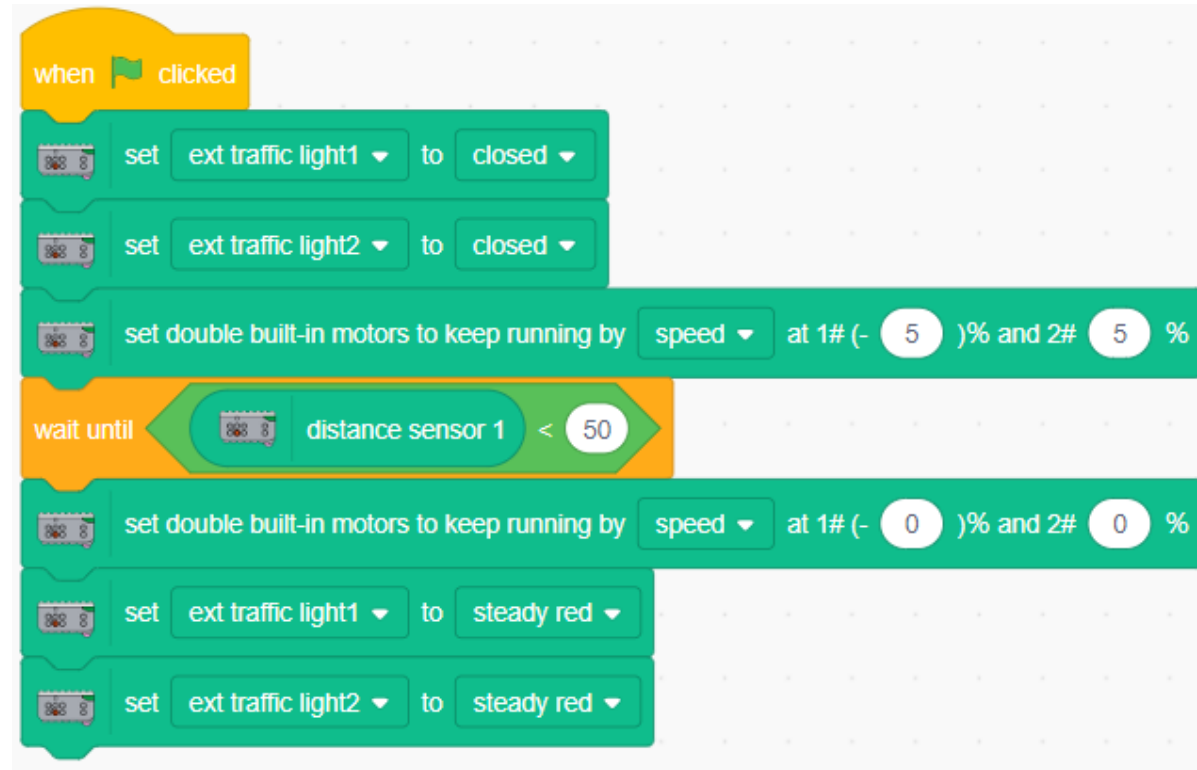
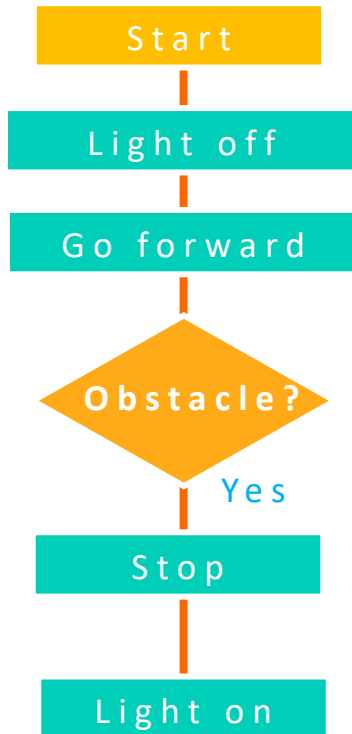
The values decrease when an obstacle is detected.





Course Review

3. Program Explanation



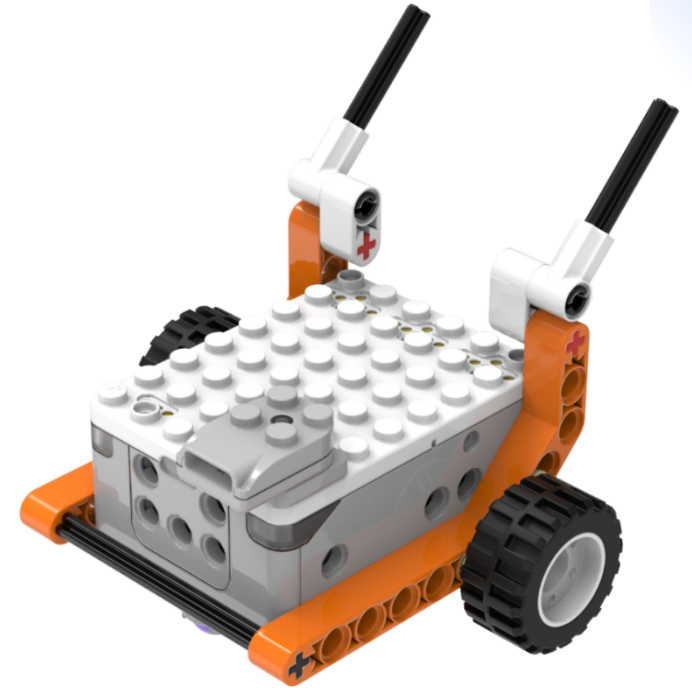


Course Review

4. Finish the task

```
when green flag clicked
  forever loop
    set double built-in motors to keep running by speed at 1# (- 3 )% and 2# 3 %
    wait until distance sensor 1 < 50
    set double built-in motors to keep running by speed at 1# (- 0 )% and 2# 0 %
    wait until distance sensor 1 > 50
```

The image shows a Scratch script on a grid background. It starts with a 'when green flag clicked' event block. This is followed by a 'forever' loop containing four blocks: a 'set double built-in motors to keep running by speed' block with values 3 and 3, a 'wait until distance sensor 1 < 50' block, another 'set double built-in motors to keep running by speed' block with values 0 and 0, and a final 'wait until distance sensor 1 > 50' block. A small arrow icon is visible at the bottom right of the loop block.



Please use your own kit.

Do not put any parts in your mouth.

Please clean up after use.

Please raise your hand if you have any questions.



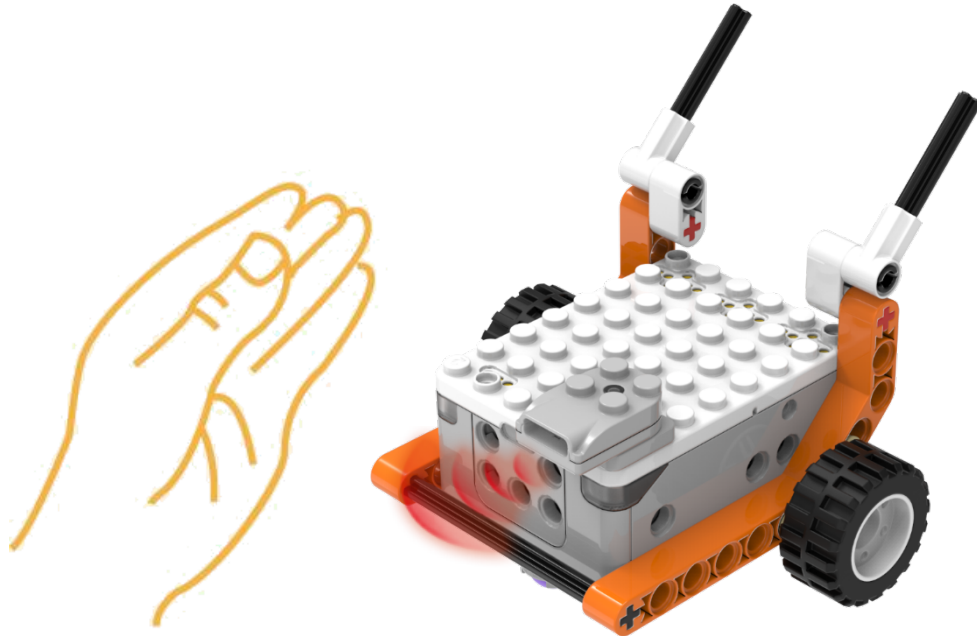
INTRODUCTION





Scenarios

Do you all know about gesture-controlled cars? We can enable the robot to sense different positions of the hand, allowing the car to respond with different movements and control its forward and backward motion.

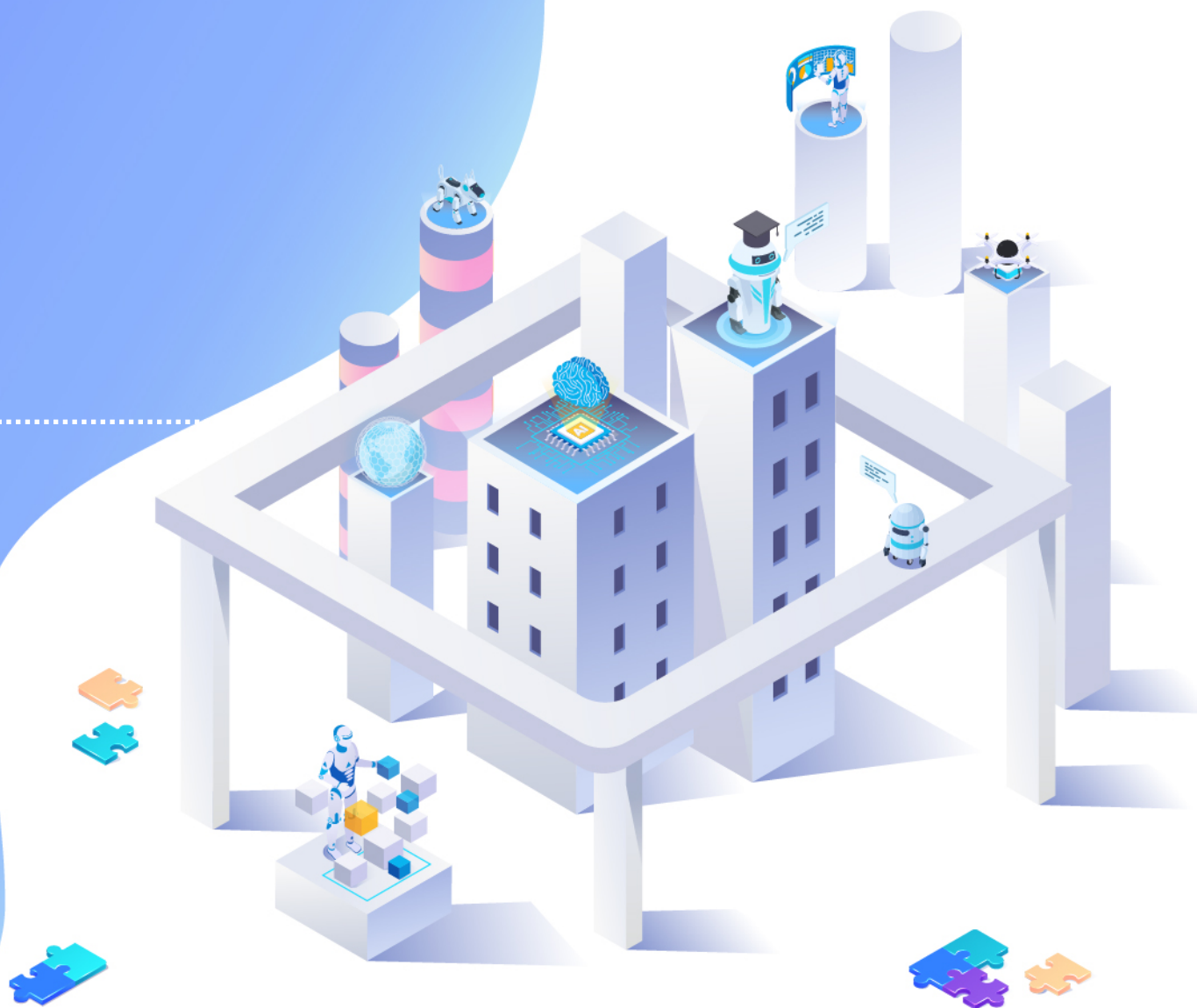


Dear kids:
What sensor can we use to detect the position of the hand?
How can we make the car perform different actions?

Let's embark on our exploration journey through "gesture control"!

Gesture Control

AI Courses

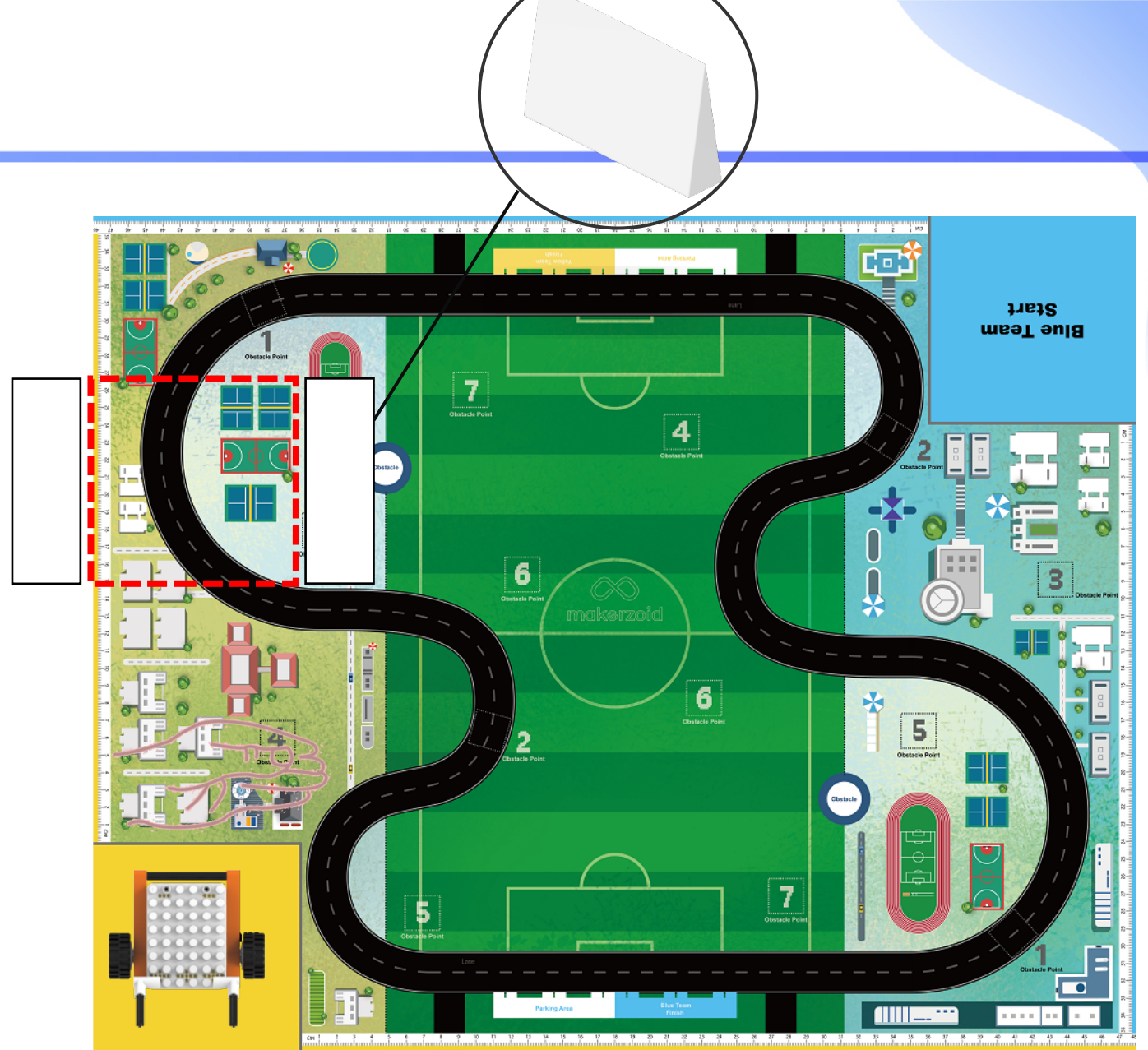
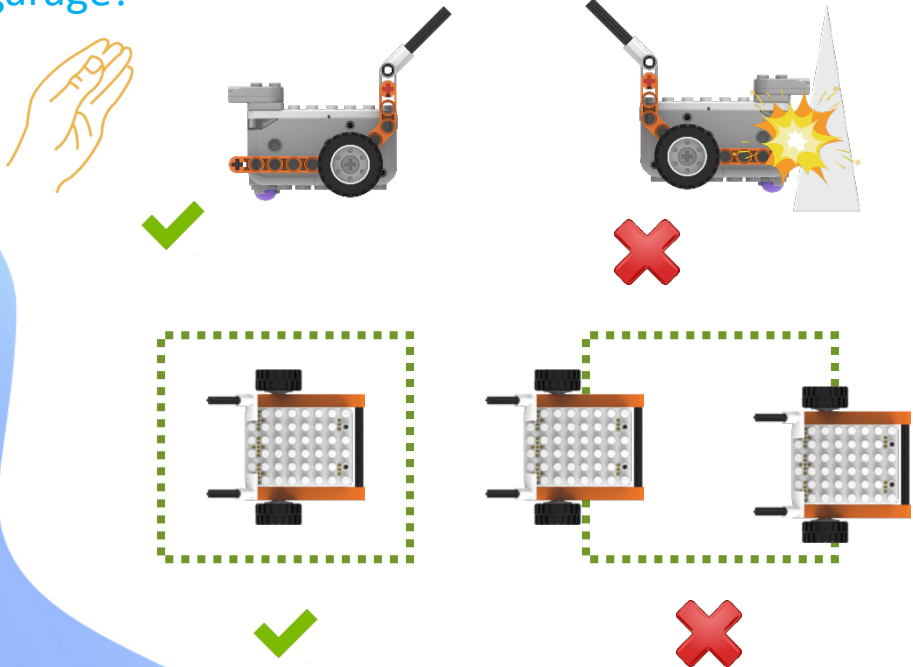




Scenarios

Competition rules:

1. The contestant's car starts from the starting point and reaches the finish line through gesture control.
2. Let's see who can control the car to stop in the garage!





Scenarios

Question :

Kids, do you know:

What sensor can be used to detect the position of the hand?

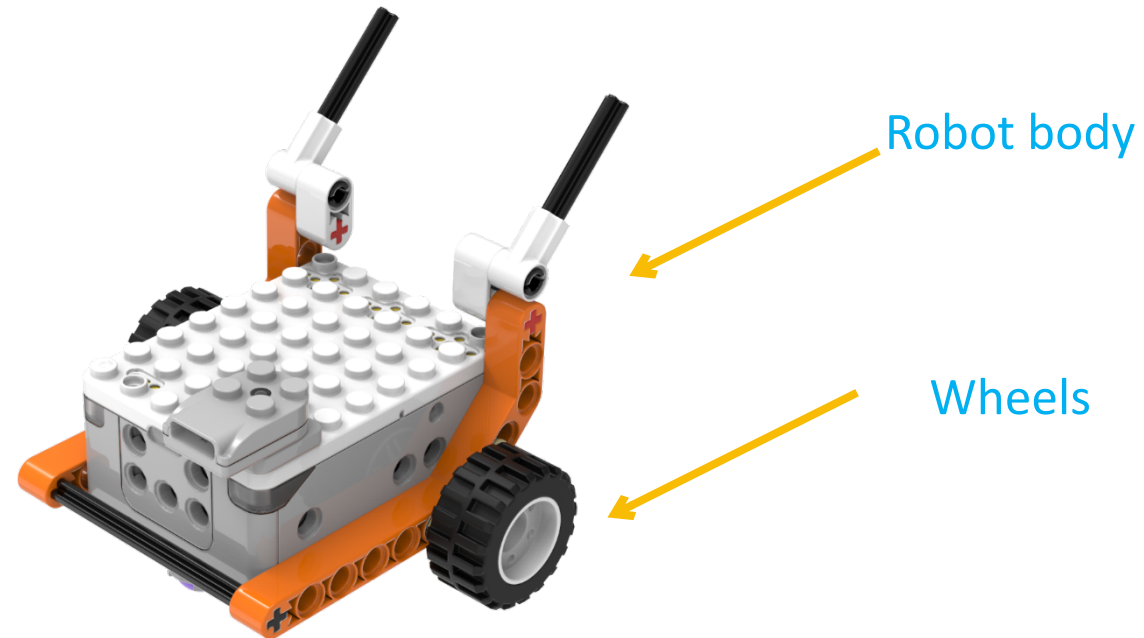
How can we make the car perform different actions?





Scenarios

Today, everyone is a junior engineer. Let's work together to complete the gesture control course!



ASSEMBLY





The Final Model

Robot body assembly



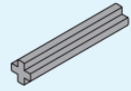
Robot body



Assembly

1

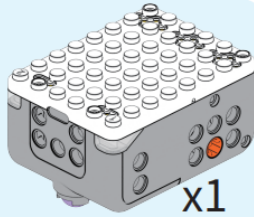
3



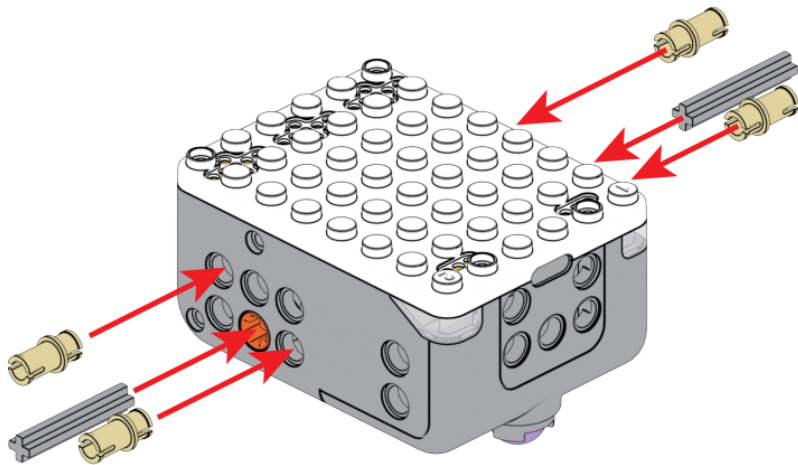
x2



x4

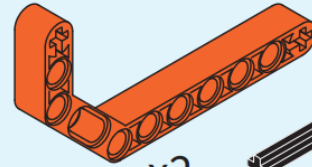


x1



2

8



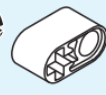
x2



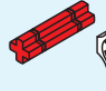
x1



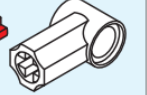
x2



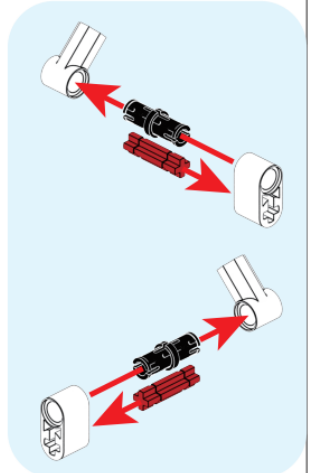
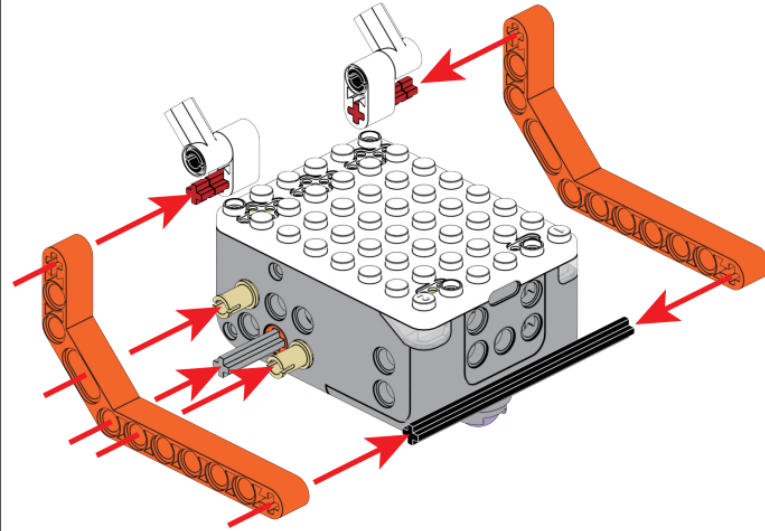
x2



x2



x2





Assembly

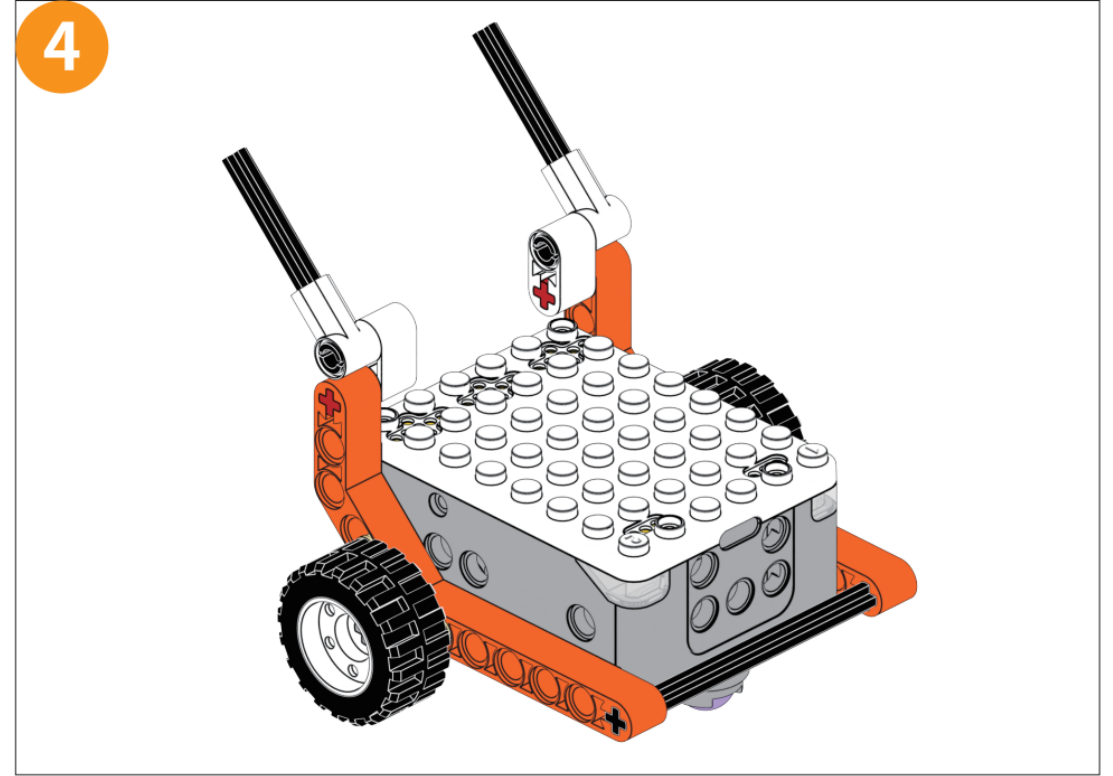
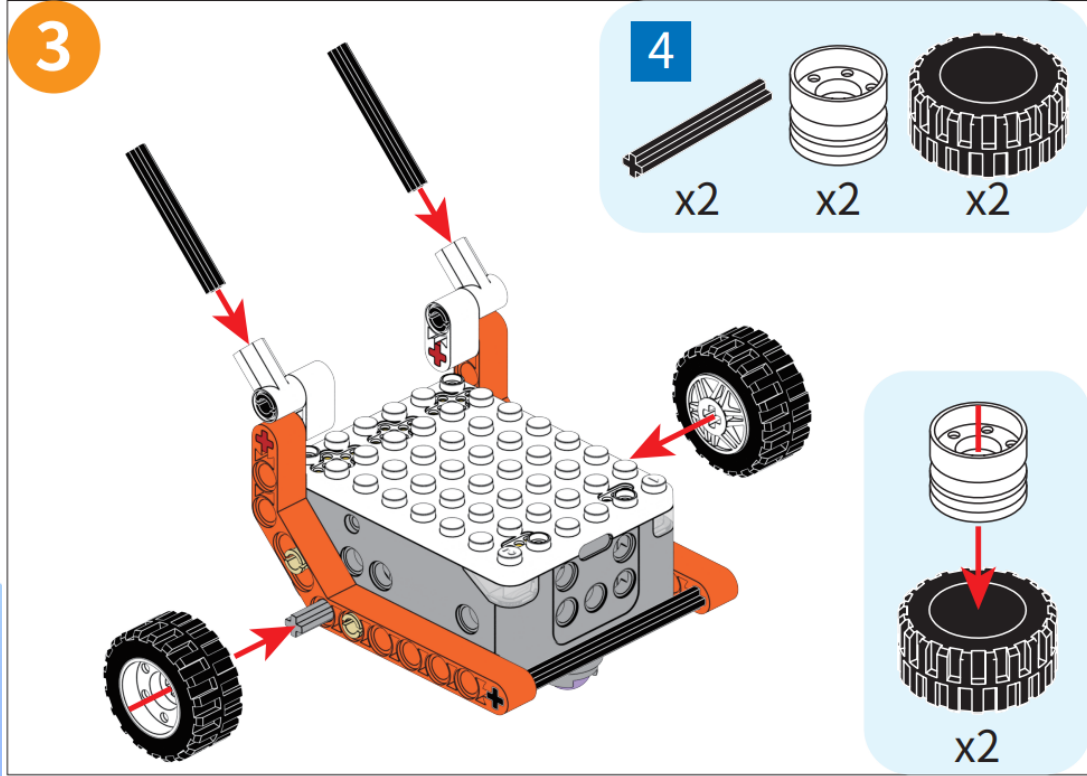
Assemble the wheels



Wheels



Assembly

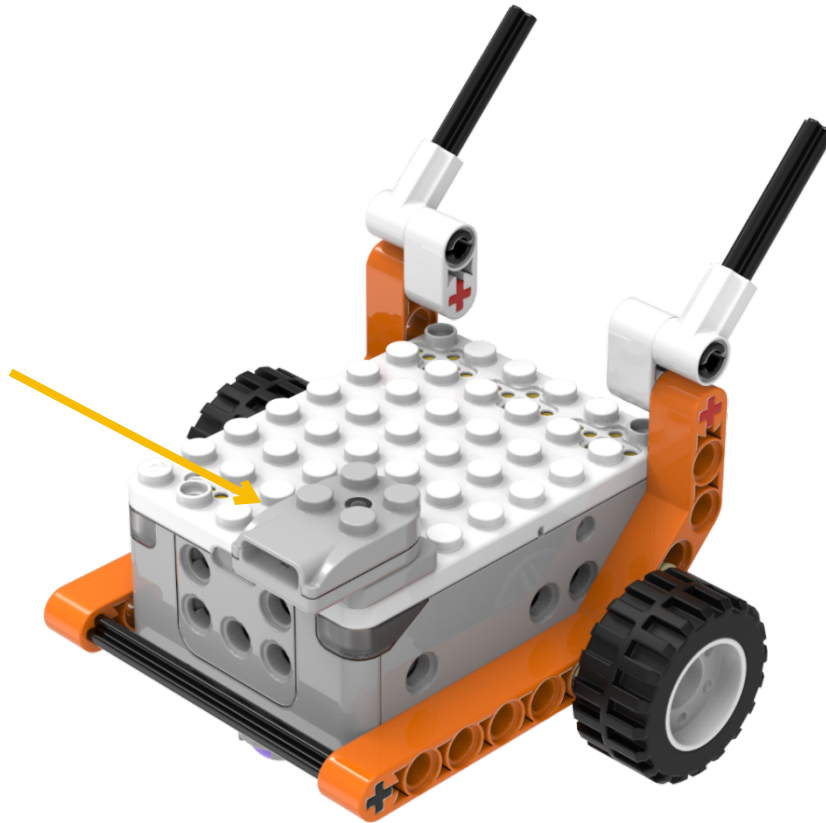




Assembly

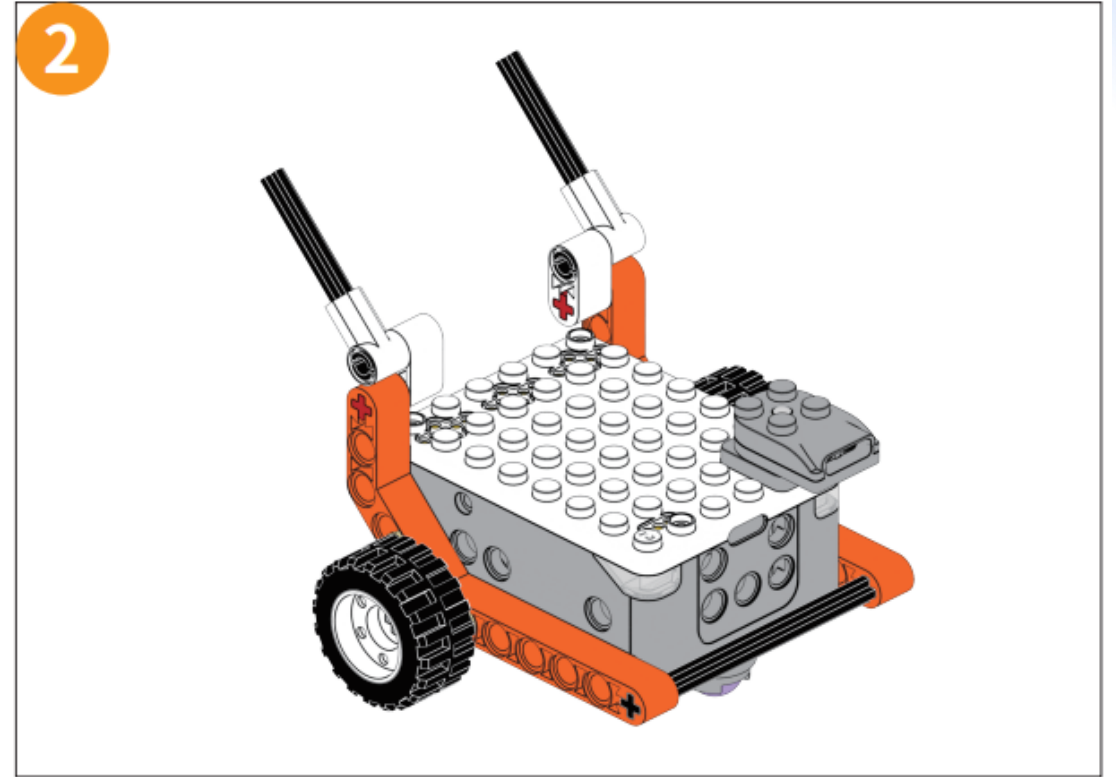
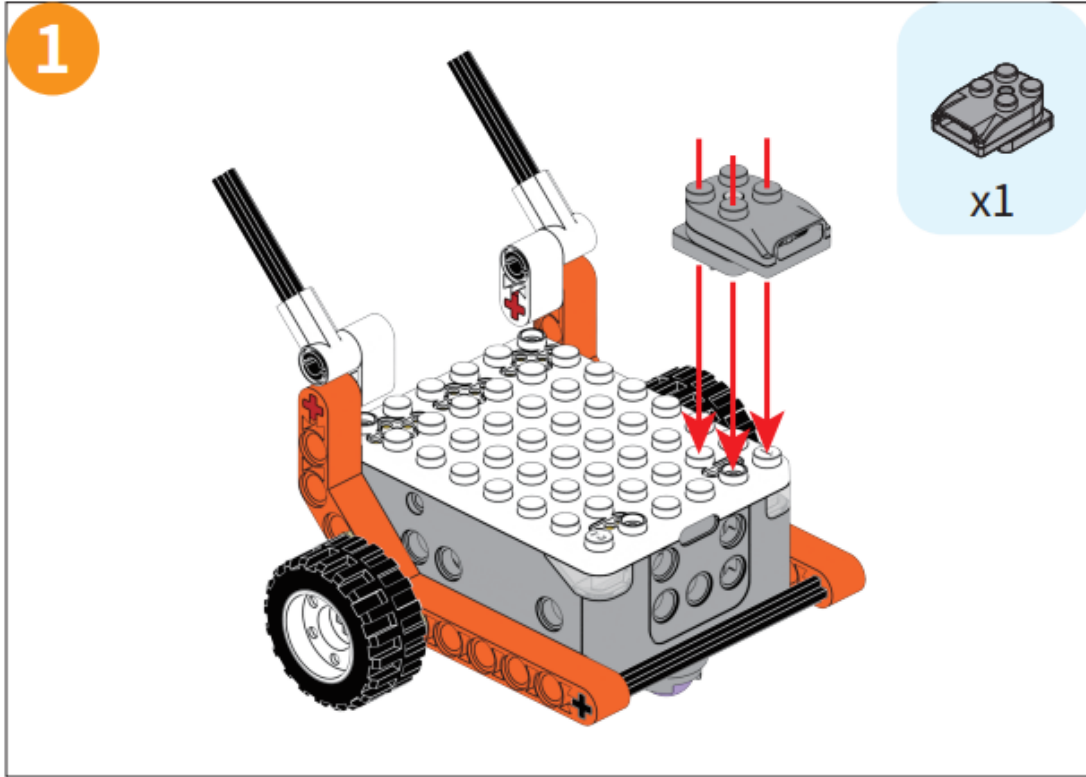
Assemble the rotary IR sensor

Rotary IR
sensor





Assembly



PROGRAMMING



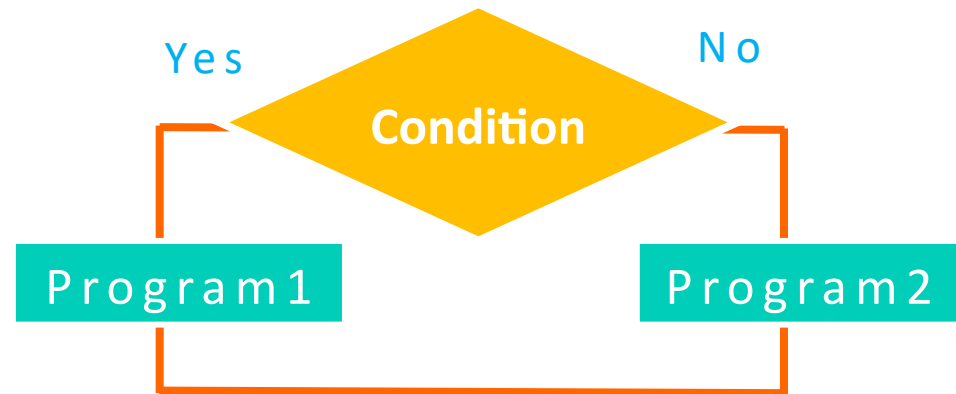
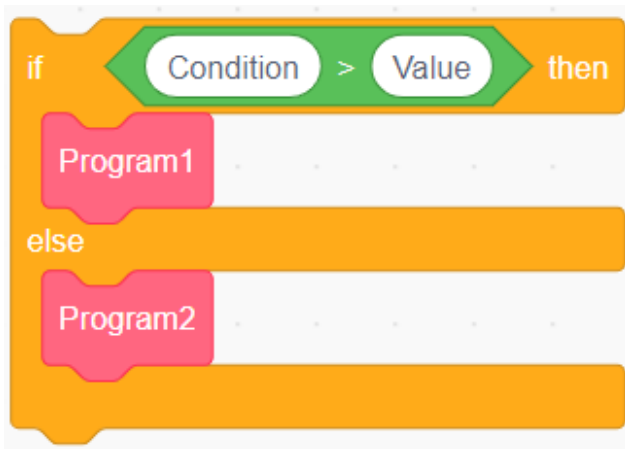
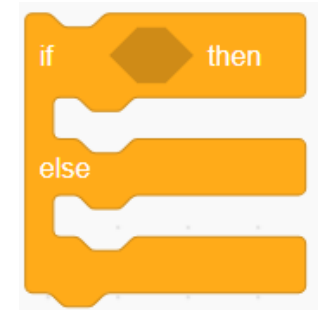


Introductions

Branching structure

Branching structure: Choose different execution paths based on different conditions.

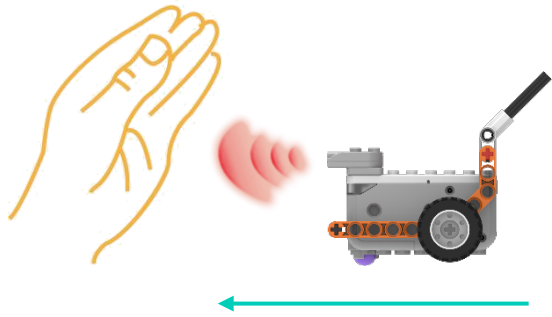
The "If-Then-Else" module can implement different program selections based on conditional statements.



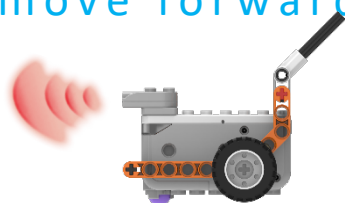


Introductions

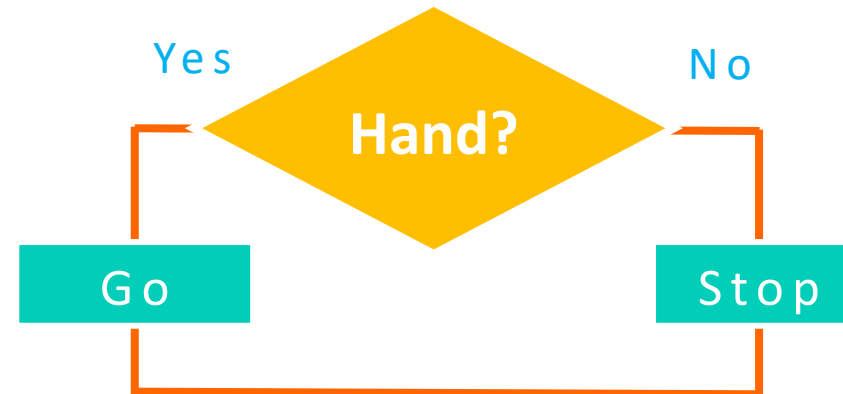
We can use a rotating infrared sensor to detect gestures, allowing us to control the car's movement and stopping. For situations where we need to make a decision before choosing an action, we should use a branching structure.



Detecting the hand makes the car move forward.



If no hand is detected, the car stops.



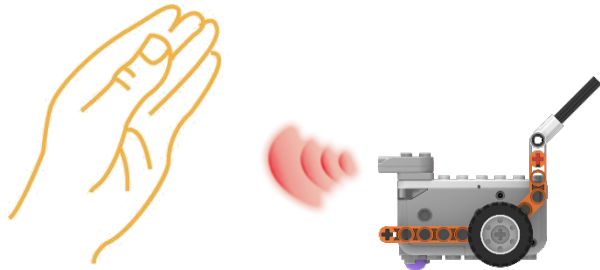
The execution of a branching structure is based on certain conditions to select the execution path.



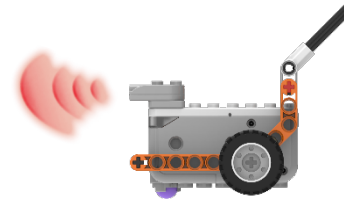
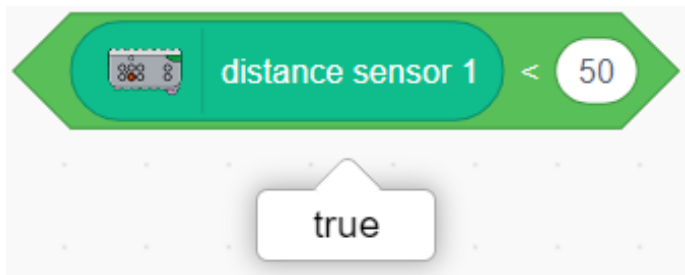
Introductions

Module Explanation

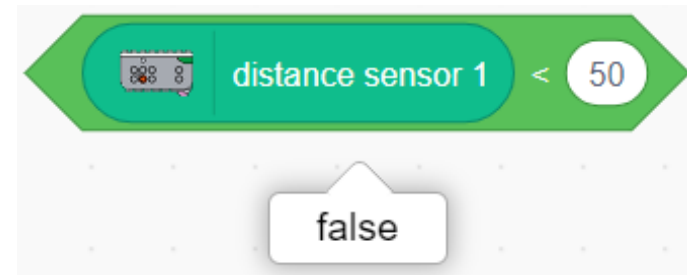
Using an infrared sensor, set a value to determine whether the hand is present.



Detecting the hand makes the car move forward.



If no hand is detected, the car stops.

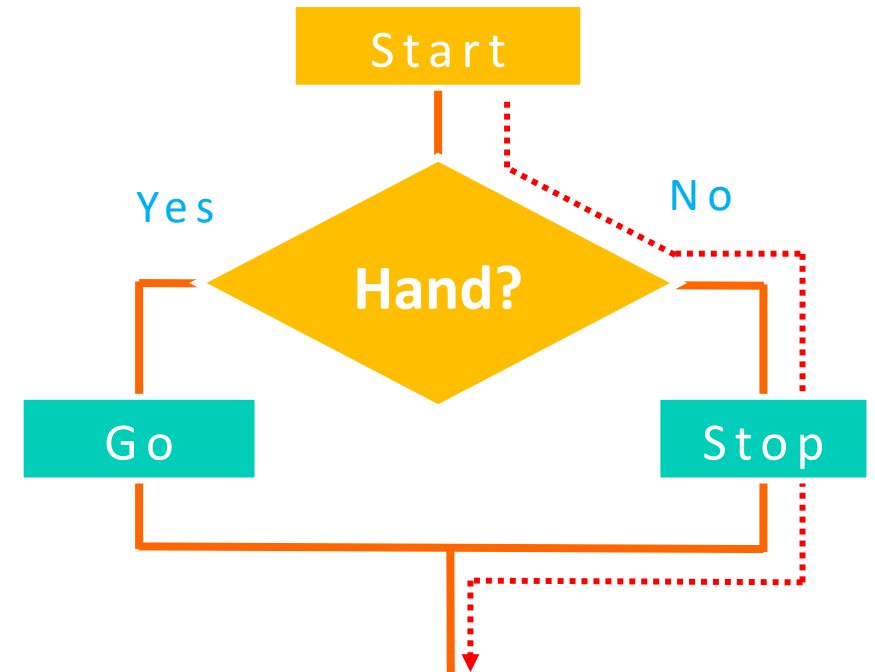
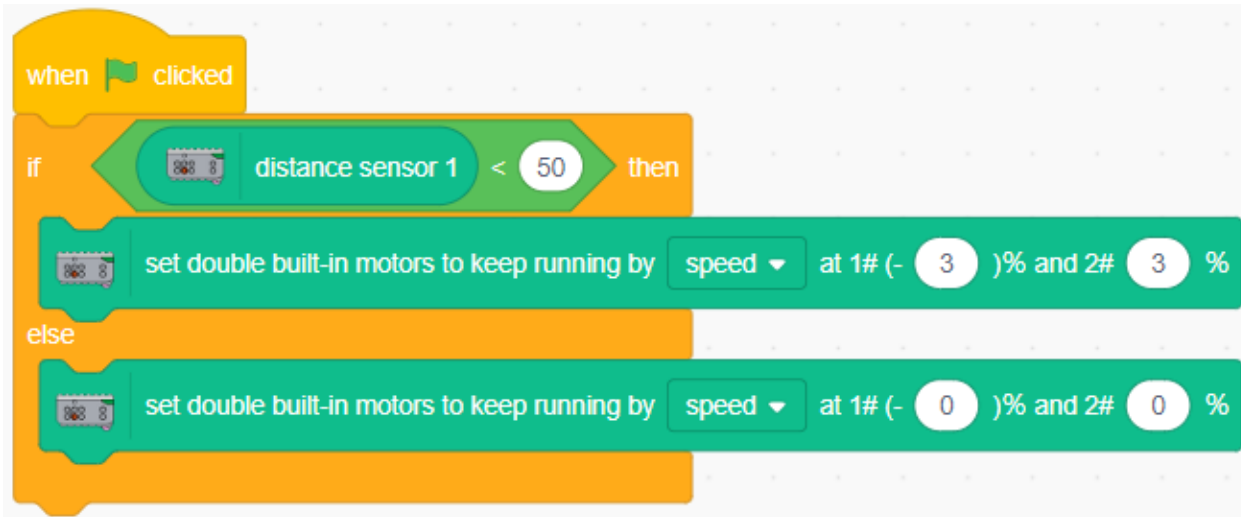




Introductions

Program Explanation

In Case 1, the program may not move because it only executes once. It follows the "else" path and ends immediately.

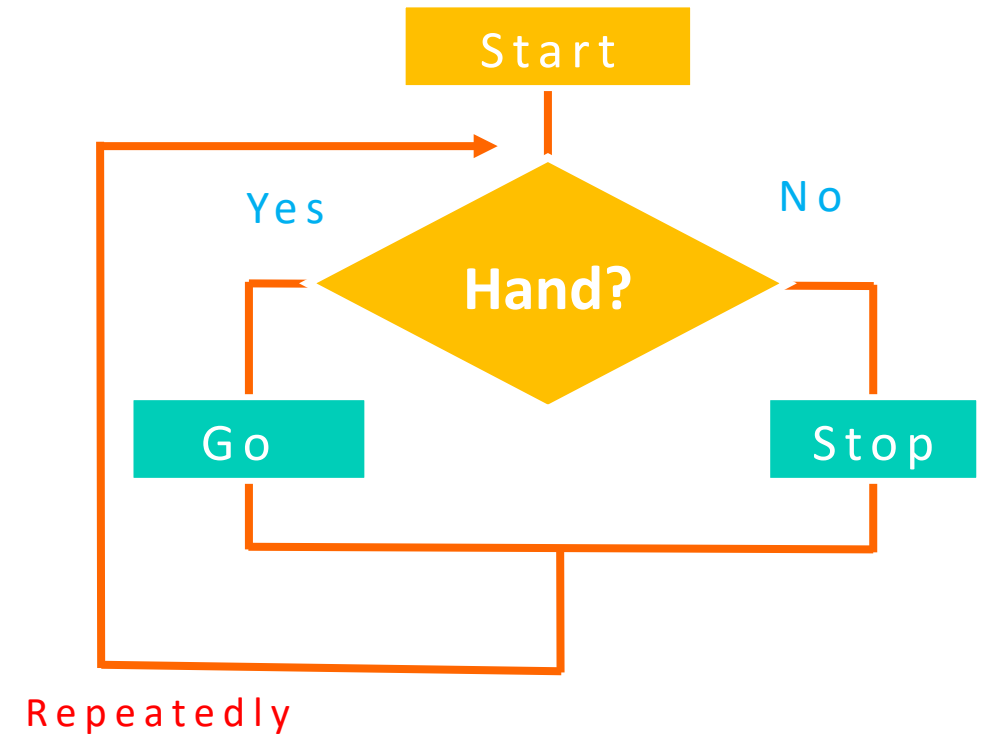
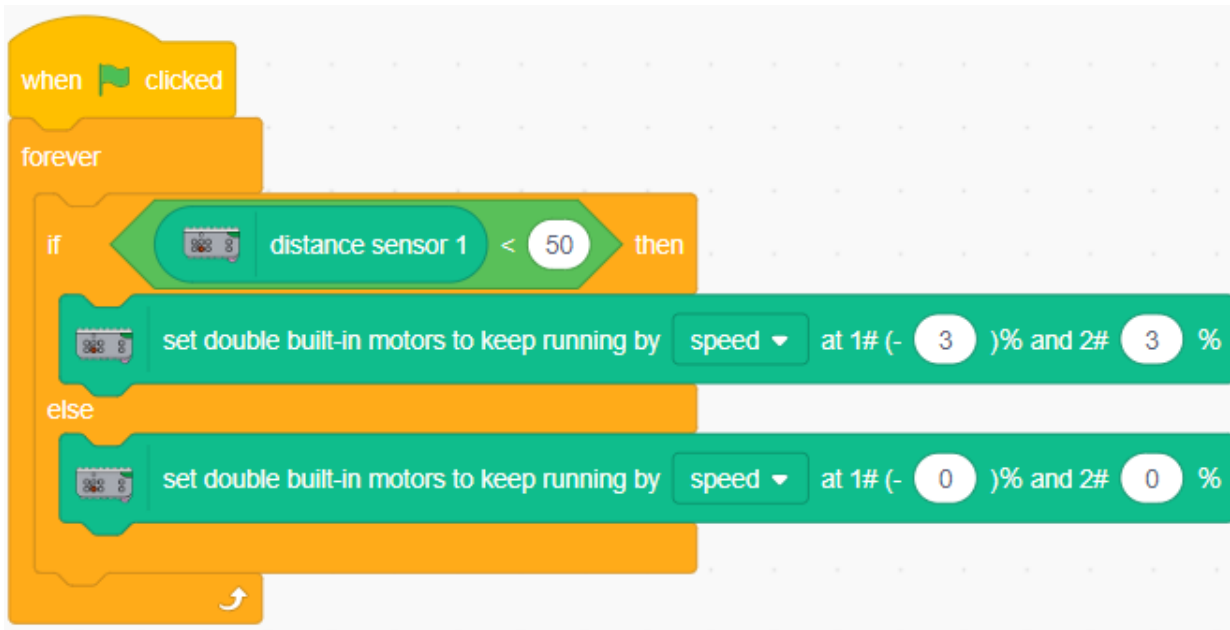




Introductions

Program Explanation

You can use the "Forever" module to allow the robot to continuously run the program, constantly checking for the presence of a hand nearby.





Introductions

Let's play:

Click the start button and see if the robot can move forward and stop using gesture control!



```
when clicked
  forever
    if distance sensor 1 < 50 then
      set double built-in motors to keep running by speed at 1# (- 3 )% and 2# 3 %
    else
      set double built-in motors to keep running by speed at 1# (- 0 )% and 2# 0 %
```

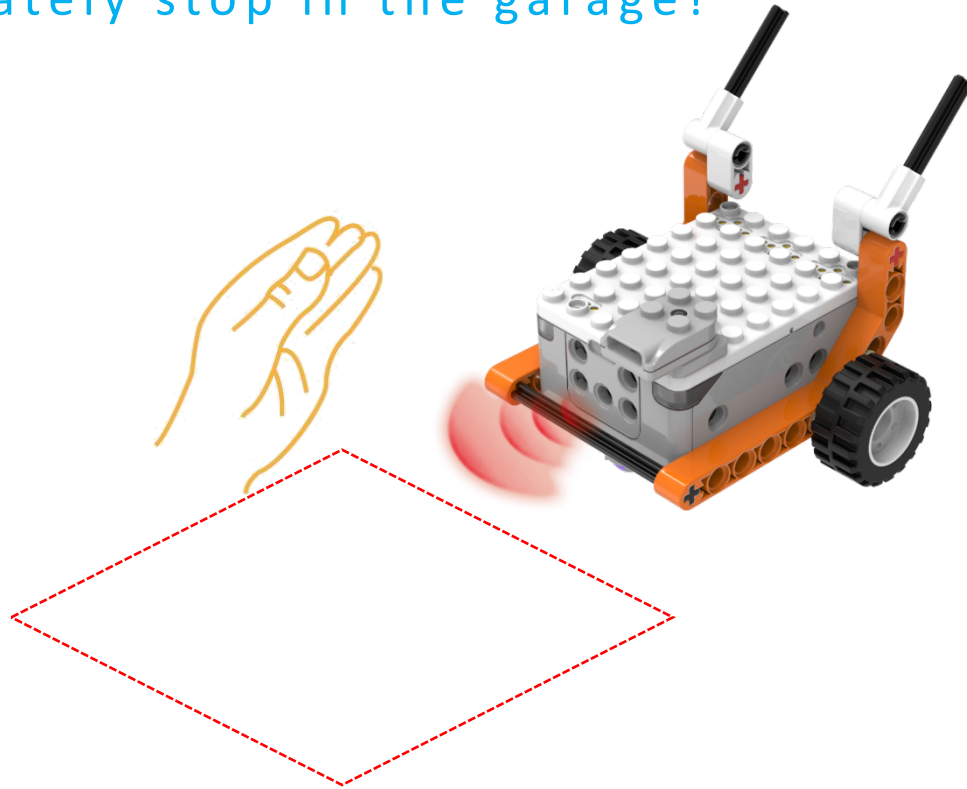




Play and Try

Let's compete:

Contestants, get ready! Let's see who can accurately stop in the garage!



Kids, is there a way to make the robot even stronger?

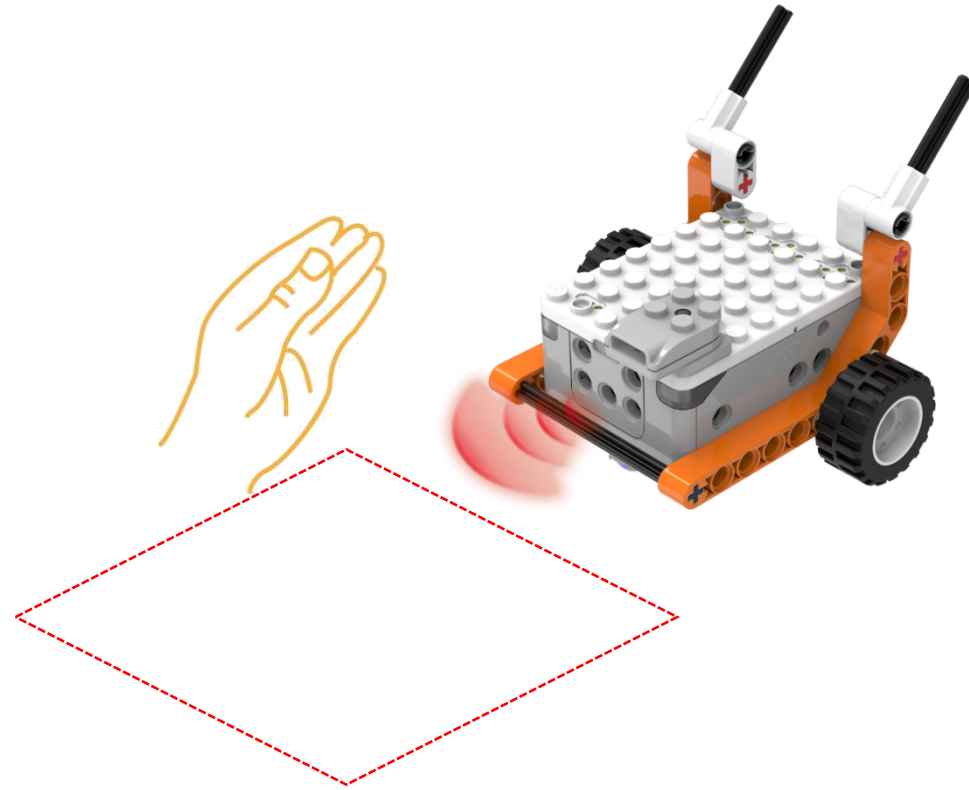
CREATION





Create

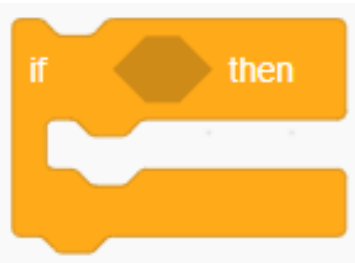
1. Are there other ways to write the program?



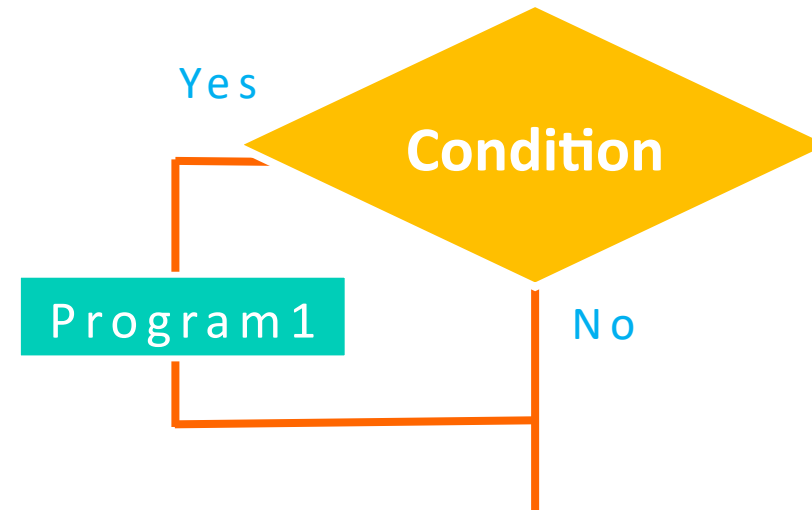
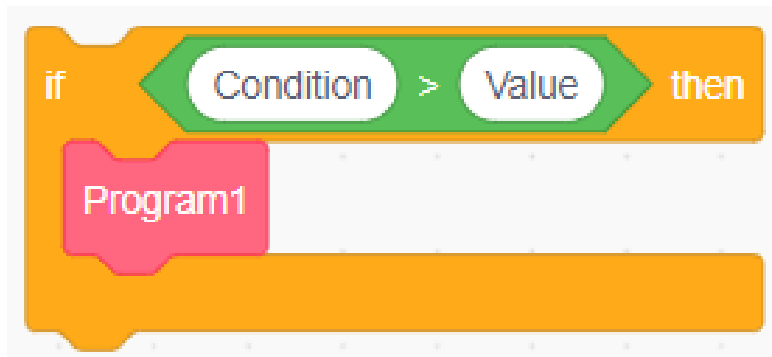


Introductions

Module Explanation



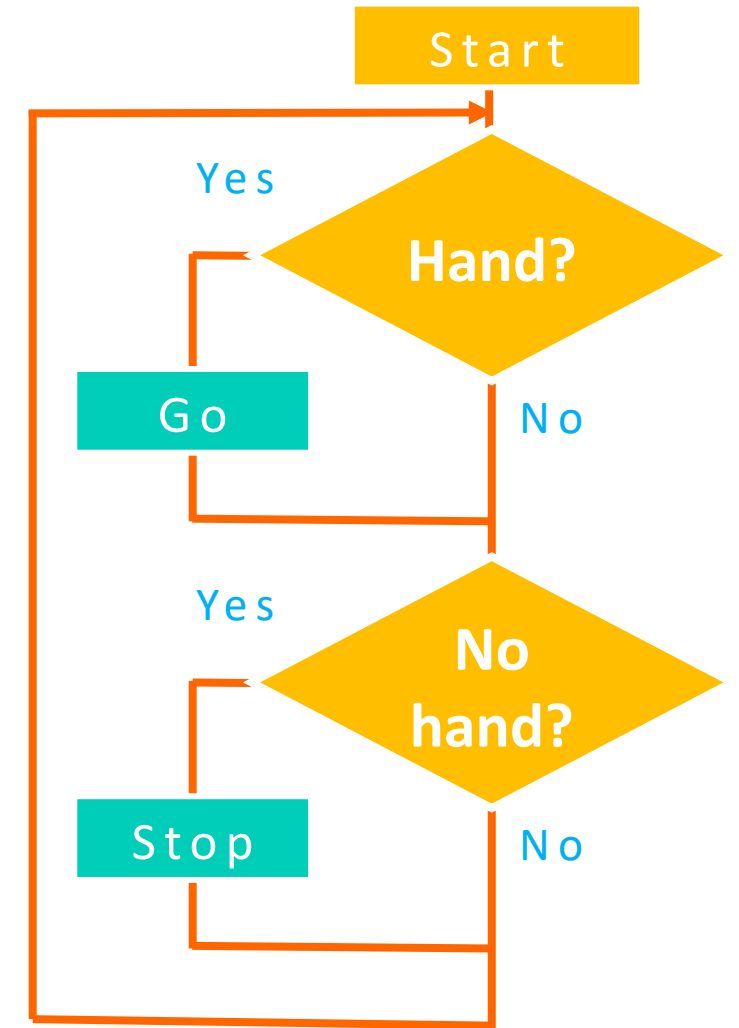
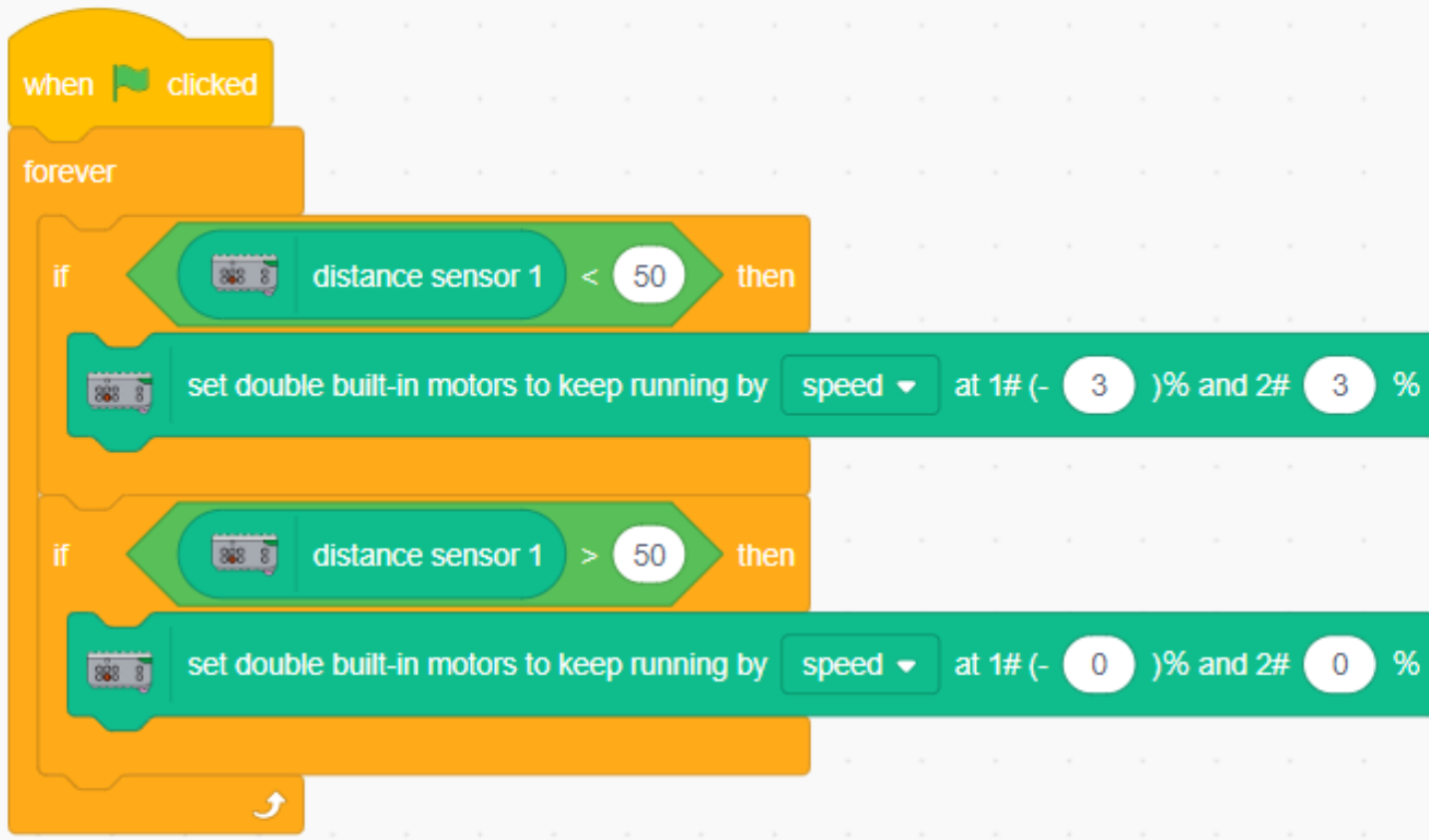
The "If-Then" model can implement actions that execute the program if certain conditions are met, and do not execute if they are not met.





Introductions

Program Explanation

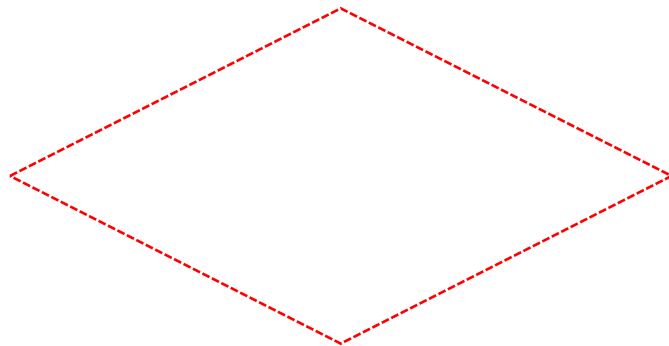
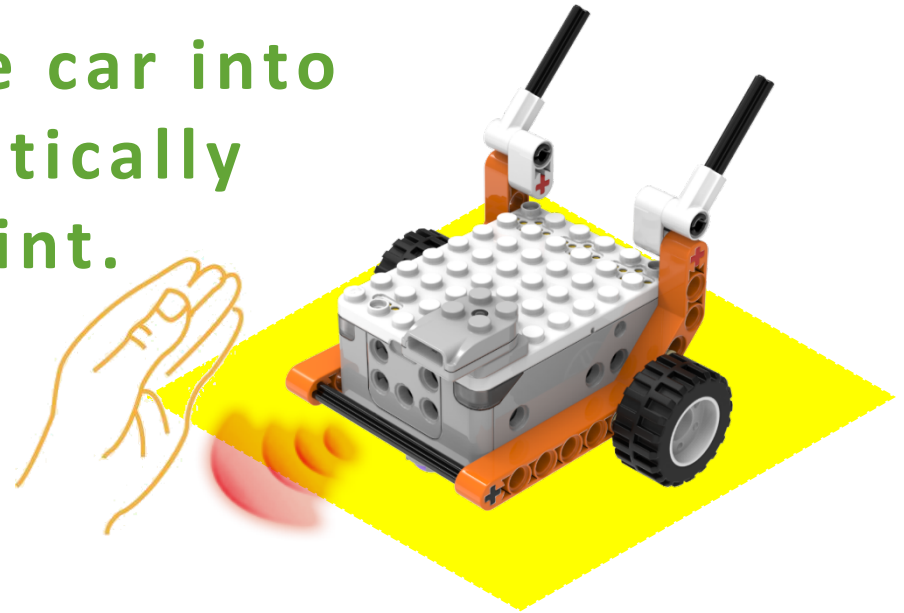


Repeatedly



Create

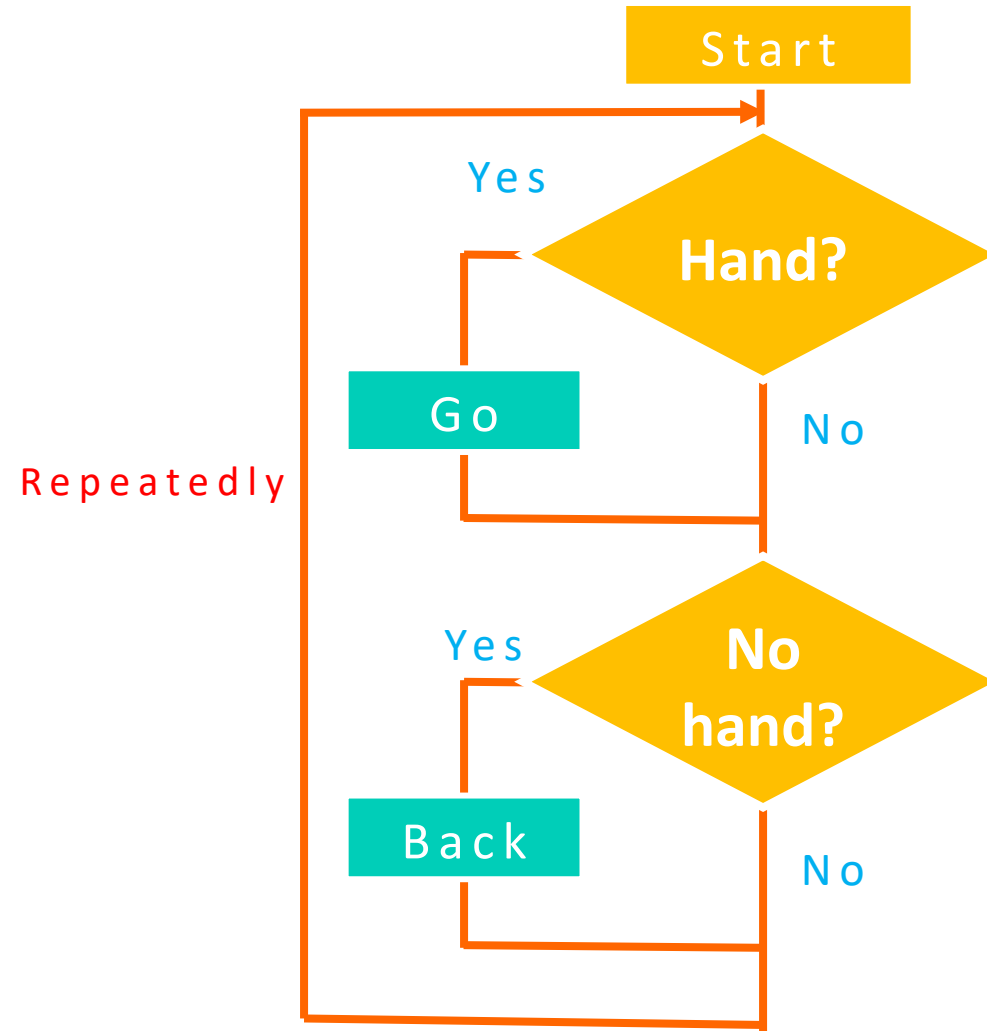
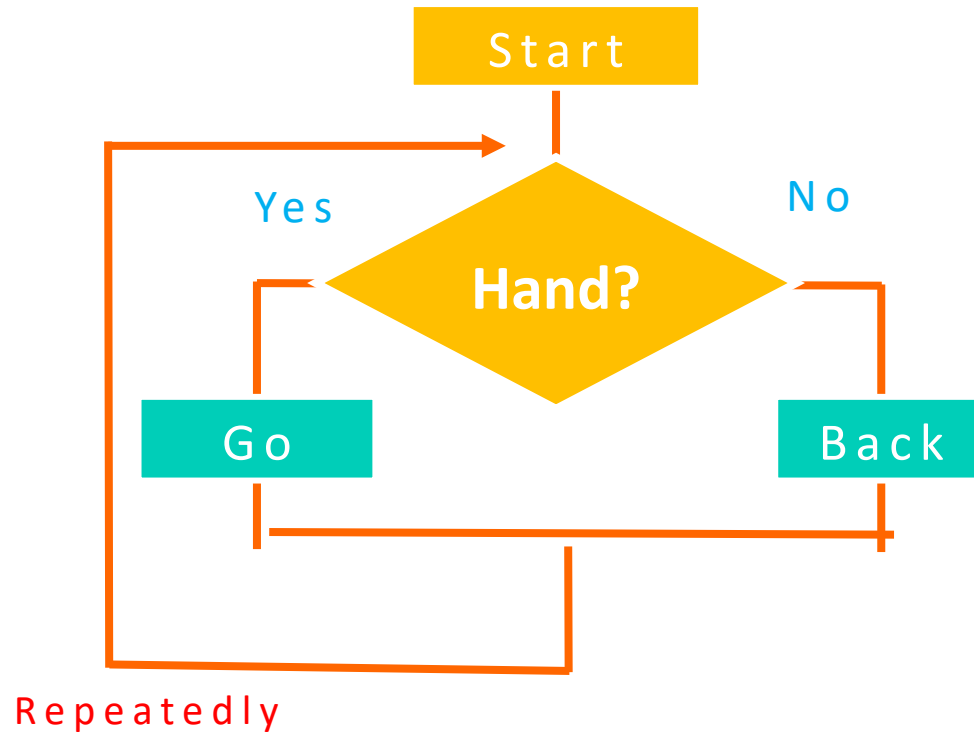
2. Once the gesture controls the car into the garage, the car will automatically reverse back to the starting point.





Introductions

Program Explanation





Introductions

Program Explanation

```
when clicked
  forever
    if distance sensor 1 < 50 then
      set double built-in motors to keep running by speed at 1# (-3)% and 2# 3%
    if distance sensor 1 > 50 then
      set double built-in motors to keep running by speed at 1# (-3)% and 2# -3%
```

The image shows a Scratch-style block-based programming script. It starts with a yellow 'when clicked' block. Below it is an orange 'forever' loop block. Inside the loop, there are two conditional 'if' blocks. The first 'if' block checks 'distance sensor 1 < 50'. If true, it executes a green block: 'set double built-in motors to keep running by speed at 1# (-3)% and 2# 3%'. The second 'if' block checks 'distance sensor 1 > 50'. If true, it executes a green block: 'set double built-in motors to keep running by speed at 1# (-3)% and 2# -3%'. The 'forever' loop block has a white arrow at the bottom right, indicating it repeats indefinitely.

SUMMARY



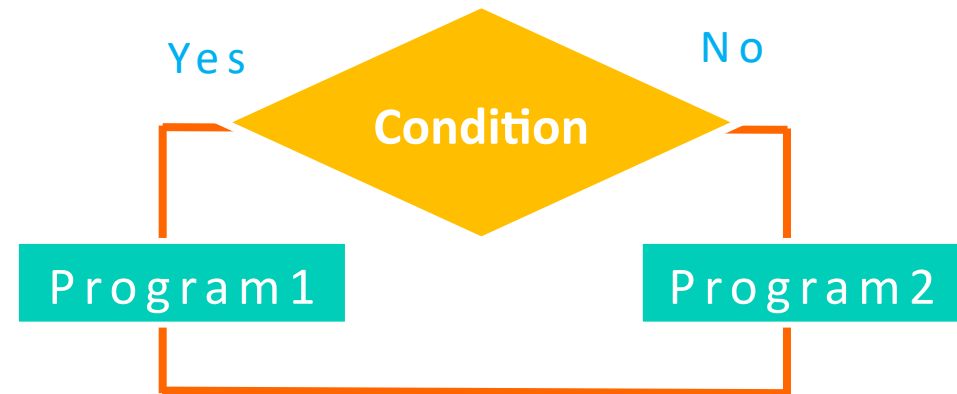
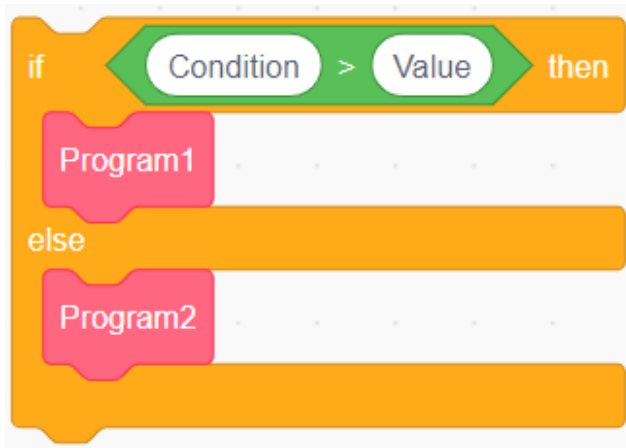
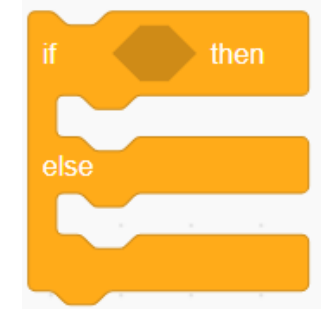


Summary

1. Branching structure

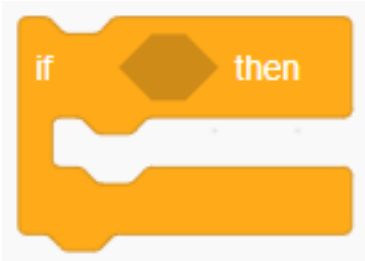
Branching structure: Choose different execution paths based on different conditions.

The "If-Then-Else" module can implement different program selections based on conditional statements.

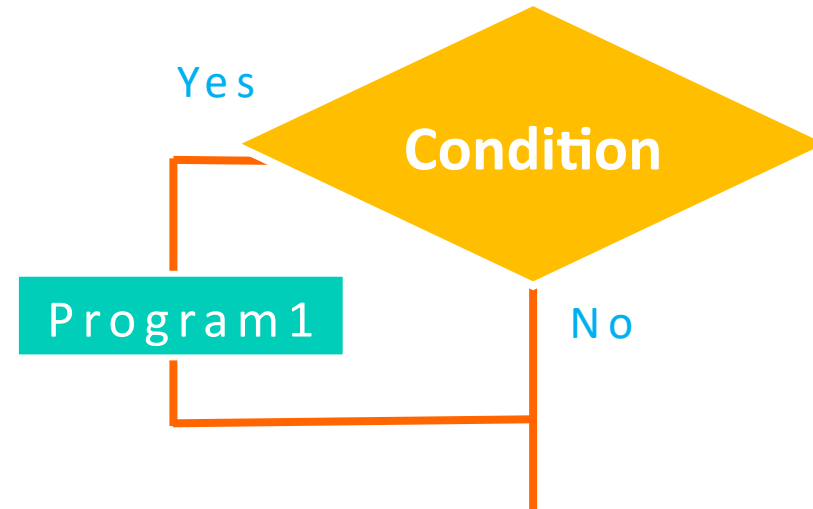
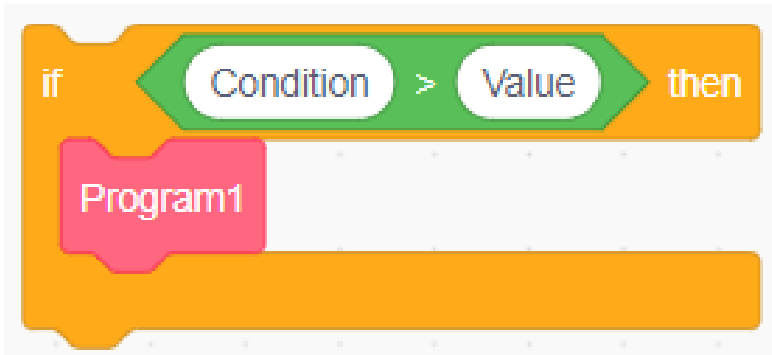




Summary



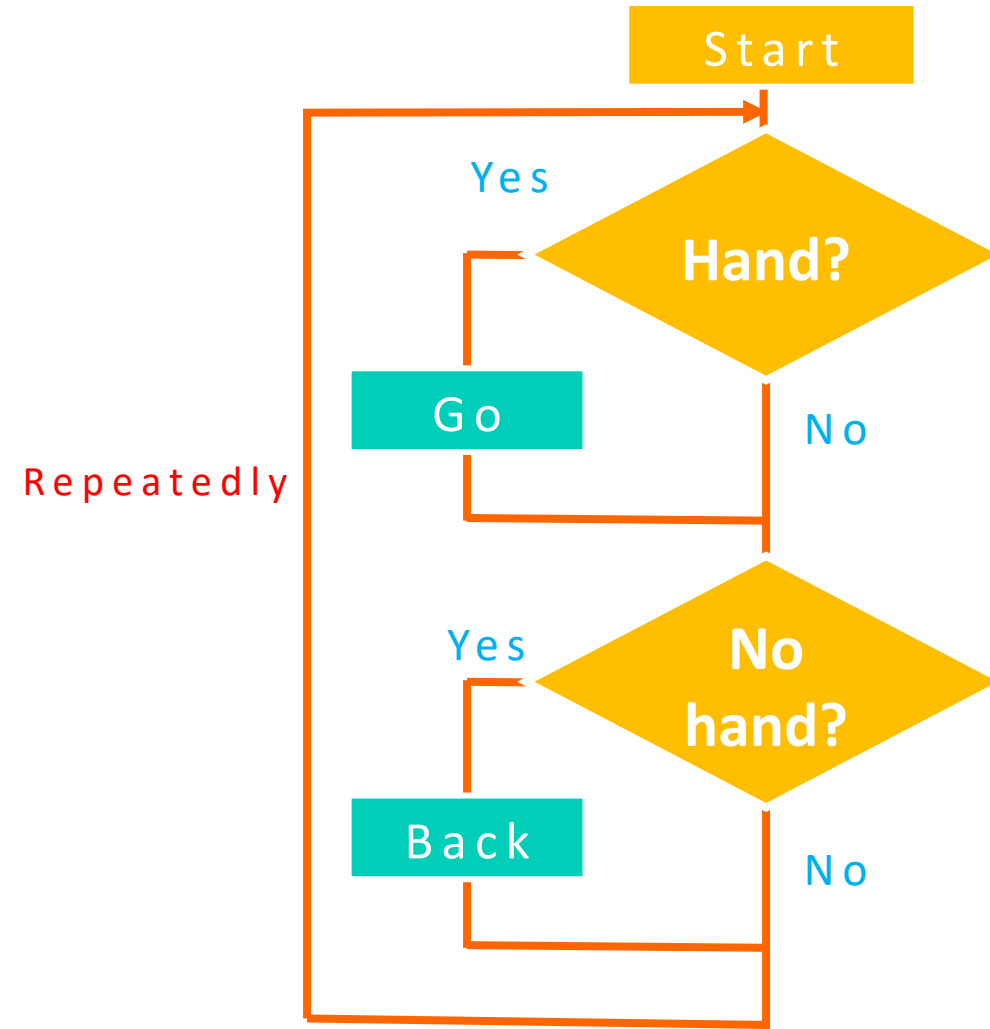
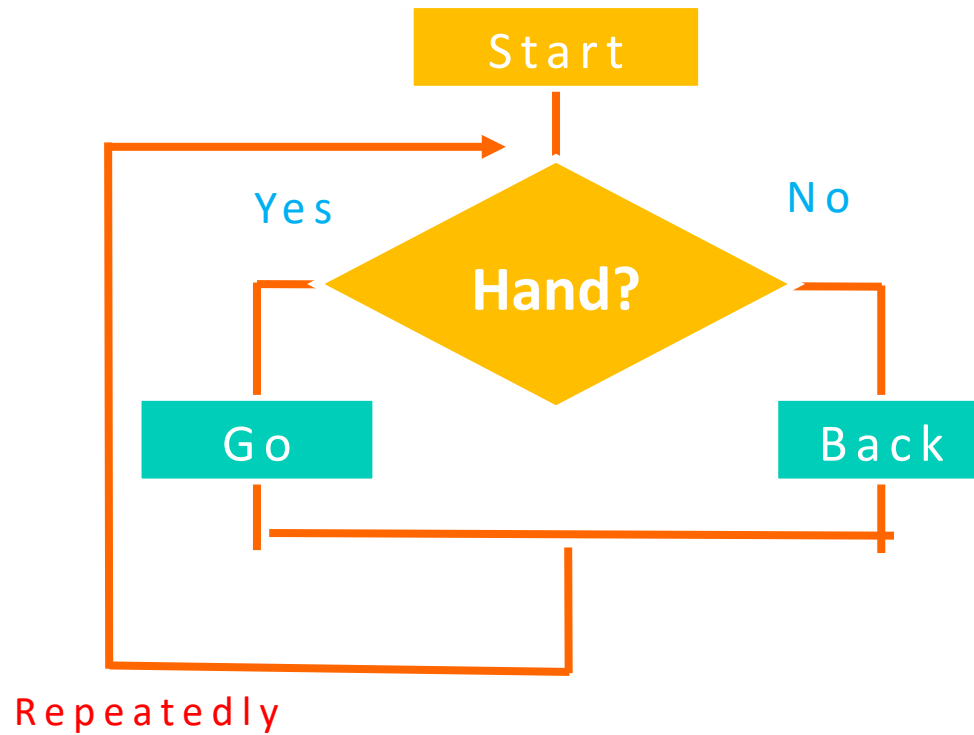
The "If-Then" model can implement actions that execute the program if certain conditions are met, and do not execute if they are not met.





Summary

2. Program Explanation

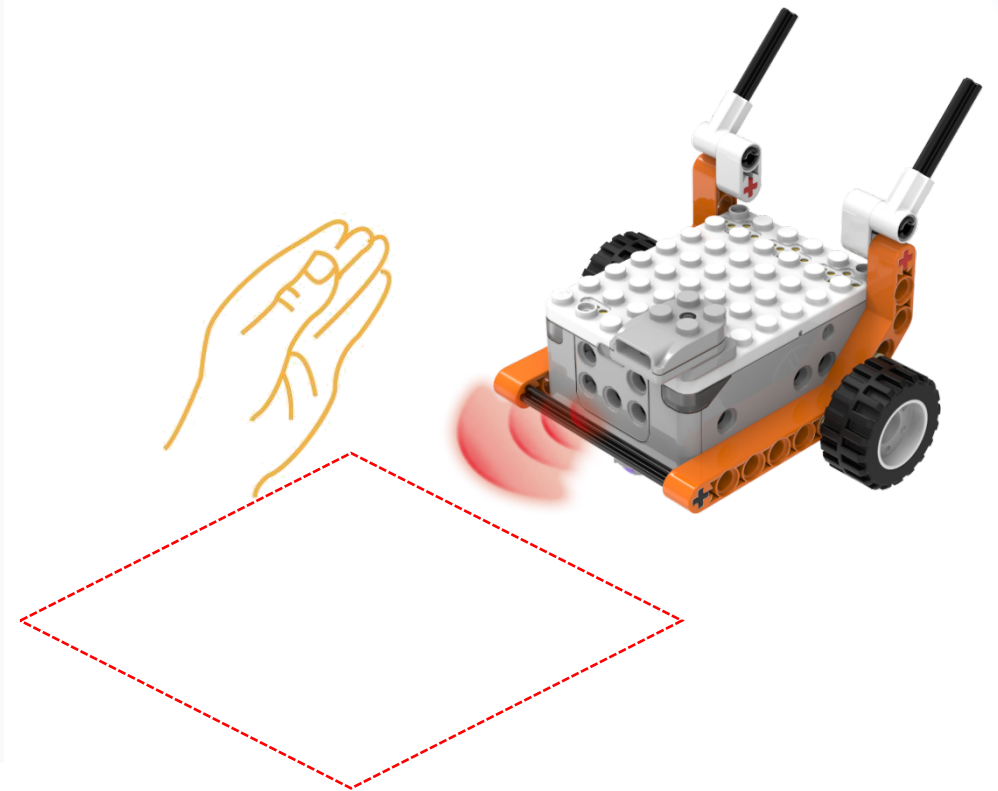




Summary

3. Finish the task

```
when clicked
  forever
    if distance sensor 1 < 50 then
      set double built-in motors to keep running by speed at 1# (-3)% and 2# 3%
    if distance sensor 1 > 50 then
      set double built-in motors to keep running by speed at 1# (-3)% and 2# -3%
```



SHARE WITH YOUR PARENTS

Share the knowledge about the Gesture Control with your mom and dad when you get home!

