# Learning Series

# Following Robot




This robotics kit is a building block robot developed by Joinmax. It builds the body of the robot through building blocks and works with programming software and sensors to achieve various functions.

# Learning Target

01

## Knowledge goal

Learn about robot systems and how they work, and learn how to control robots with acoustic sensors.

02

## Ability goal

Familiar with the sound sensitive module, master the basic usage of the acoustic sensor.

03

## Emotional attitudes and values

Understand things that are not easily accessible, keep curiosity and exploration of unknowns, accumulate experience, and develop logical reasoning skills.

# Learning Target

01

## Learning focus

The combination of ultrasound and motor.

02

## Learning difficulties

The programming follows the distance between the program and the screen.

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# Course Introduction



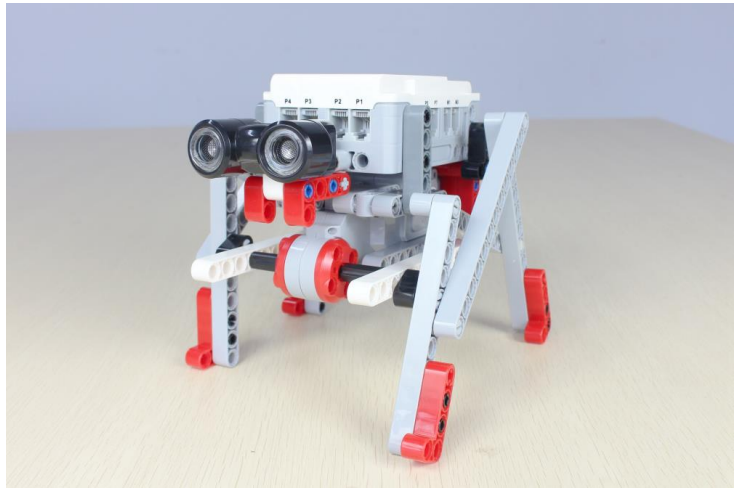
# Course Introduction



Let's look at a picture. Thinking about how he followed people to move?

The word "follow" consists of two steps: 1. Know where the target is 2. Can follow the target. In the process of following, we also need to deal with obstacles to avoid, so there are two more things, identify obstacles and avoid obstacles. So in my opinion, following at least four technical modules: human body positioning module, obstacle recognition module, dynamic path planning and obstacle avoidance, robot walking module.

# Course Introduction



Following Robot

## Know about the follower robot

The ultrasonic module is integrated and transceived to test the distance of obstacles.

In other words, the distance between the object in front of the robot and the robot can be measured. So you can do straight line follow!

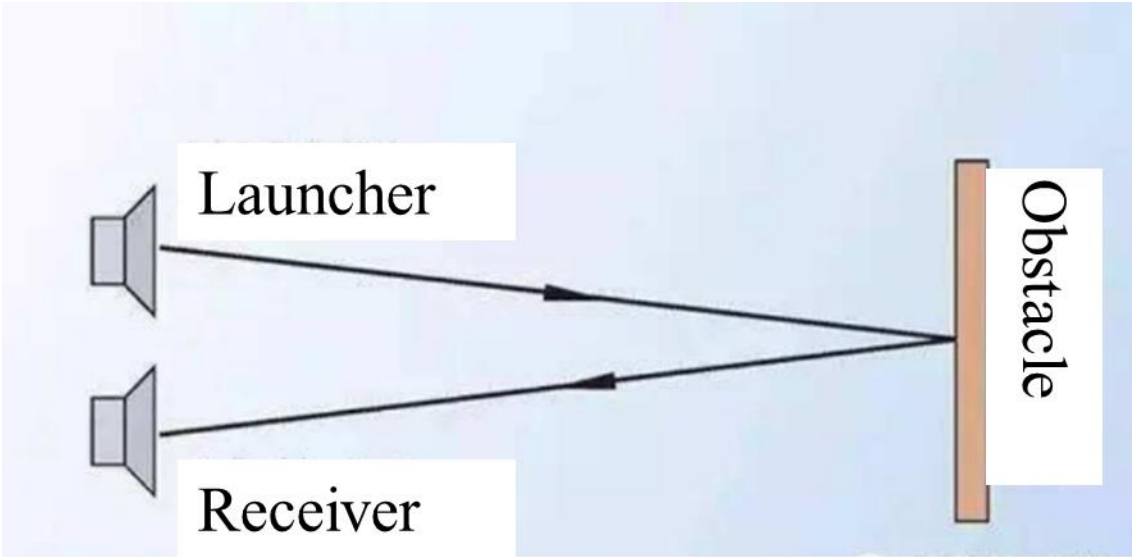
This class will build an ultrasonic follower robot. The principle of ultrasonic distance measurement.

# Teaching New Knowledge



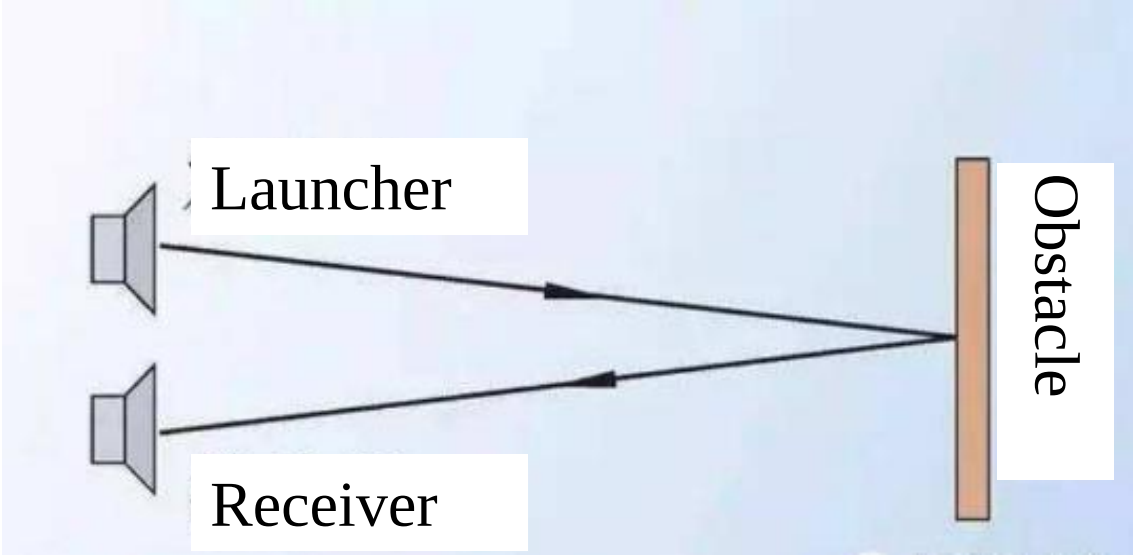
# Teaching New Knowledge

- For the English reflective ranging method: the reflective ranging method is to transmit ultrasonic waves and receive echoes generated by the measured object, and calculate the distance to be measured according to the time difference between the echoes and the transmitted waves.



# Teaching New Knowledge

- Features: The technical indicators of the ultrasonic automatic locator include positioning accuracy, response speed, and positioning range. The positioning accuracy is within 1cm, the response speed is 0.01 seconds, and the positioning range is within the field and the radius is 1.5 meters.



# Teaching New Knowledge




Uses:

The application field is mainly indoor positioning and site positioning. For example, if the car is driving the test site, the launching device is placed on the car and follows the car movement. The receiving system can trace the trajectory of the car on the computer, so that the driver can be automatically judged by the computer to be qualified, thereby reducing the workload of the invigilator.

# Teaching New Knowledge

【Electronics】-【Operators】-【< > =】



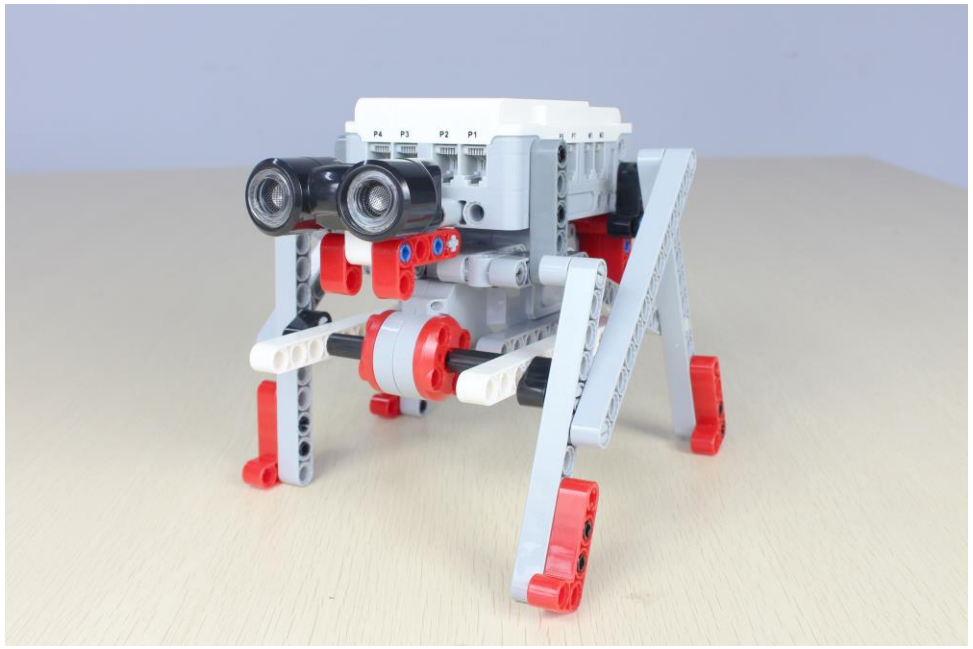

【 Electronics 】-【Display】-
【Coordinate display data】



# Design Assembly



# Design Assembly



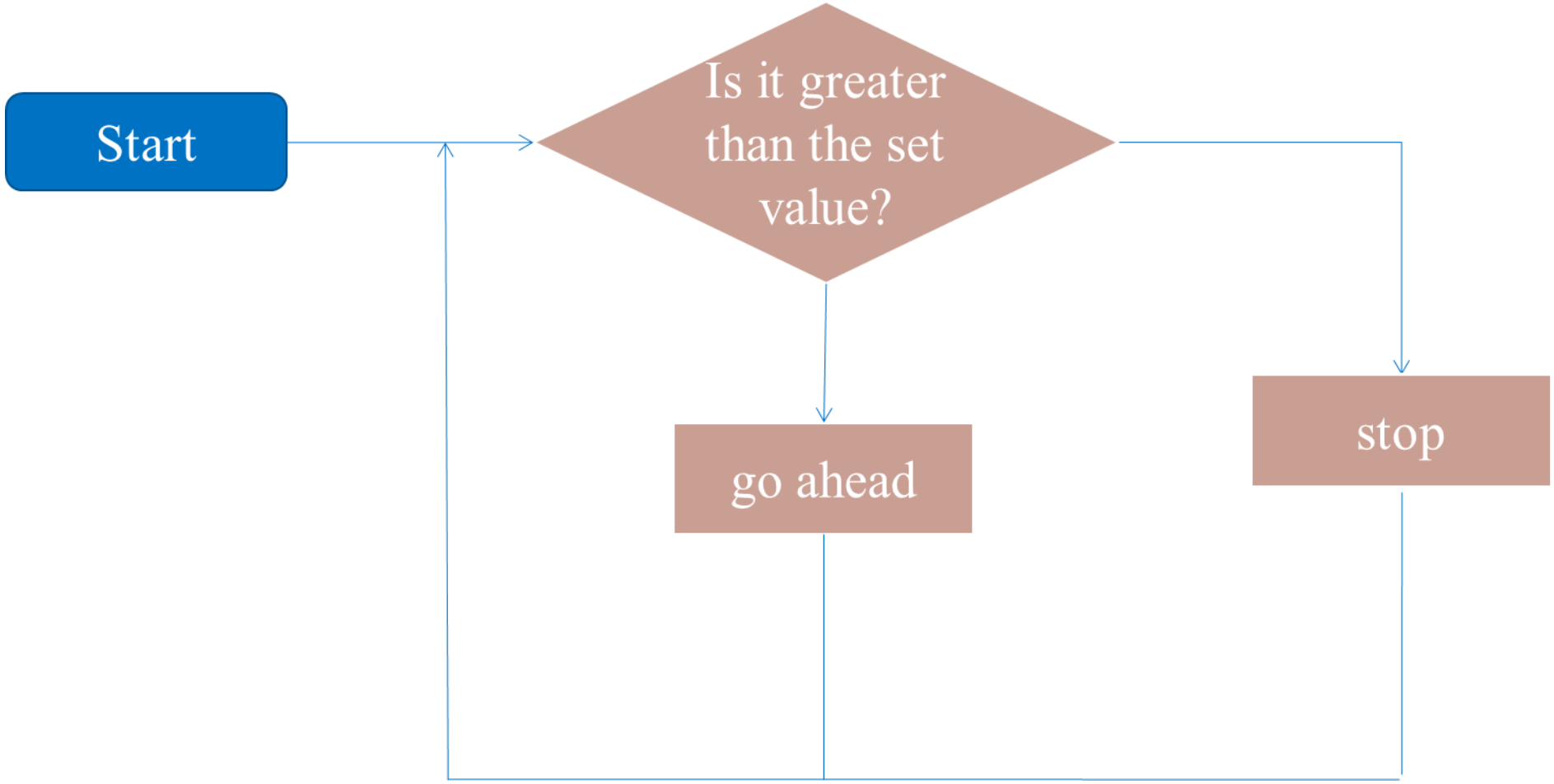
## Assembly requirements

1. stable structure
2. focus is right
3. shape match

# Programming and Debugging



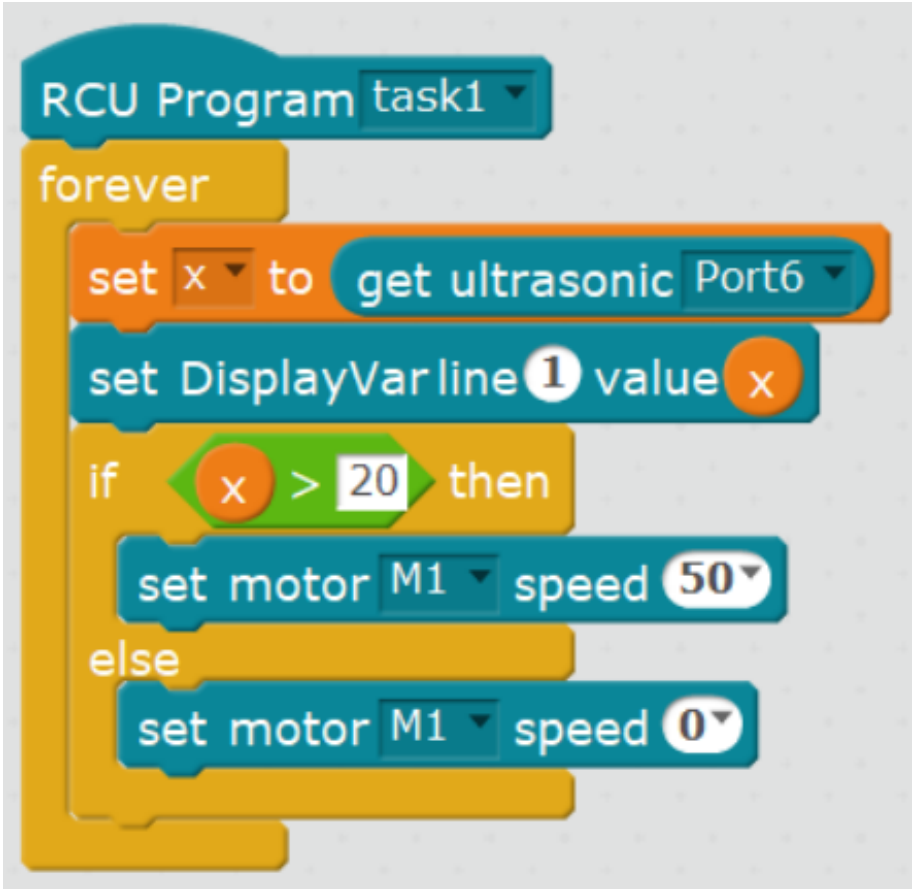
# Programming and Debugging



# Programming and Debugging

## Task 1

The value measured by the ultrasonic ranging sensor is displayed on the controller screen - the robot advances when the distance is >20 cm.



# Programming and Debugging

## Task 2

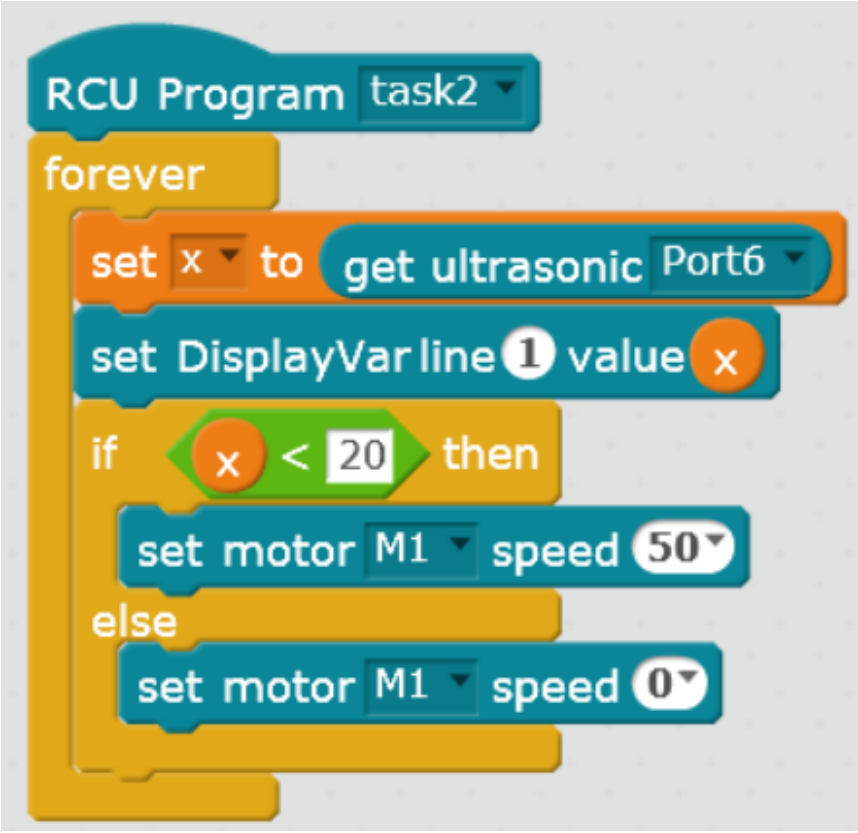
The distance is displayed at the position of the screen coordinates x20, y20.



# Programming and Debugging

## Task 3

When the distance exceeds 20cm, advance, less than or equal to 20cm stop.



# Checking Effect



# Test Effect



Review the learning content and deepen your impression.

**Question 1** What is ultrasonic positioning?

**Question 2** What is the purpose of ultrasonic positioning?

**Question 3** What is the module used for ultrasonic positioning?

# Thank you for watching

