Learning Series

Obstacle avoidance robot1



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

The use of the if statement, ultrasound and motor.

02

Ability goal

Familiar with the use of the if module, master the method of obstacle avoidance of ultrasonic sensors.

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 principle of using ultrasonic obstacle avoidance.

02

Learning difficulties

Use the if statement to write a program to avoid obstacles.

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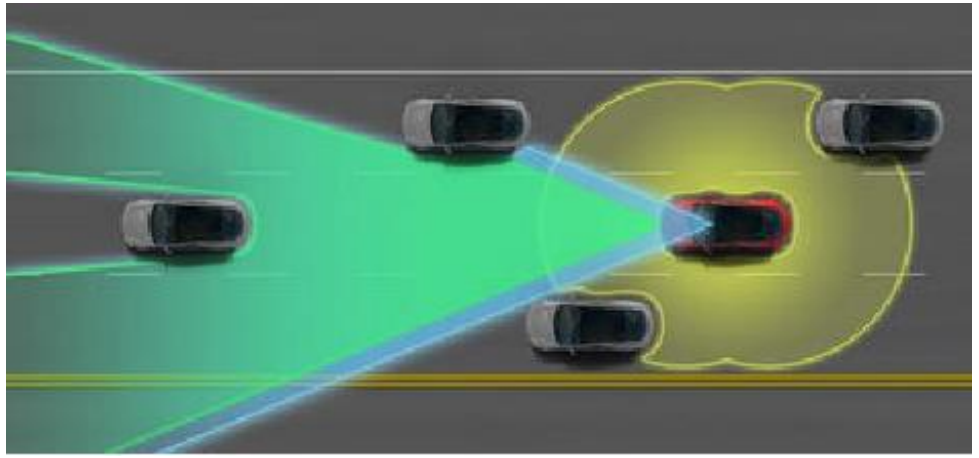
Course Introduction



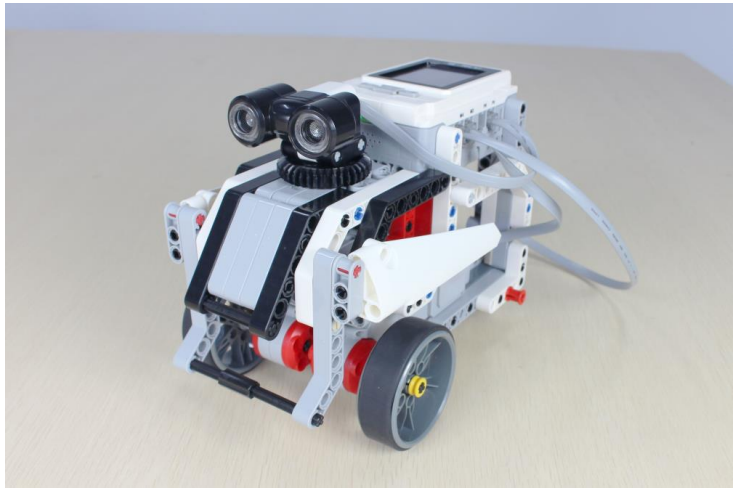
Course Introduction



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

For the outside world to hinder the movement direction of the object to make various obstacles to avoid obstacles, and continue to interrupt the previous action, this process is to avoid obstacles.

Course Introduction



Obstacle avoidance

Obstacle avoidance robots

The robot that determines the position of the obstacle based on the time difference of the received sound wave, thereby avoiding the obstacle

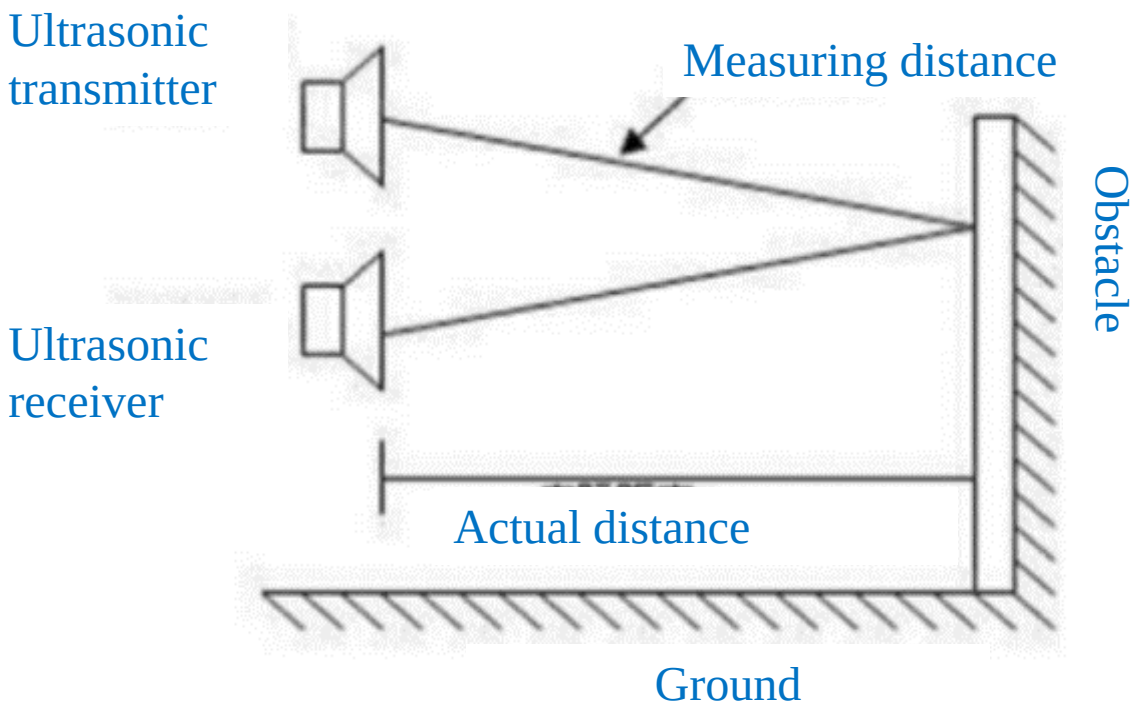
This lesson will build an obstacle avoidance robot. It is a function that uses ultrasonic ranging.

Teaching New Knowledge



Teaching New Knowledge

Ultrasonic waves can pass through various media (gas, liquid, solid) to detect objects with acoustic impedance mismatch. The speed of sound is the distance per unit time when sound waves travel in an elastic medium. For example, in 20°c (68°f) dry air, the speed of sound is 343 meters per second (1,125 feet per second).



Teaching New Knowledge

Measuring safety distance



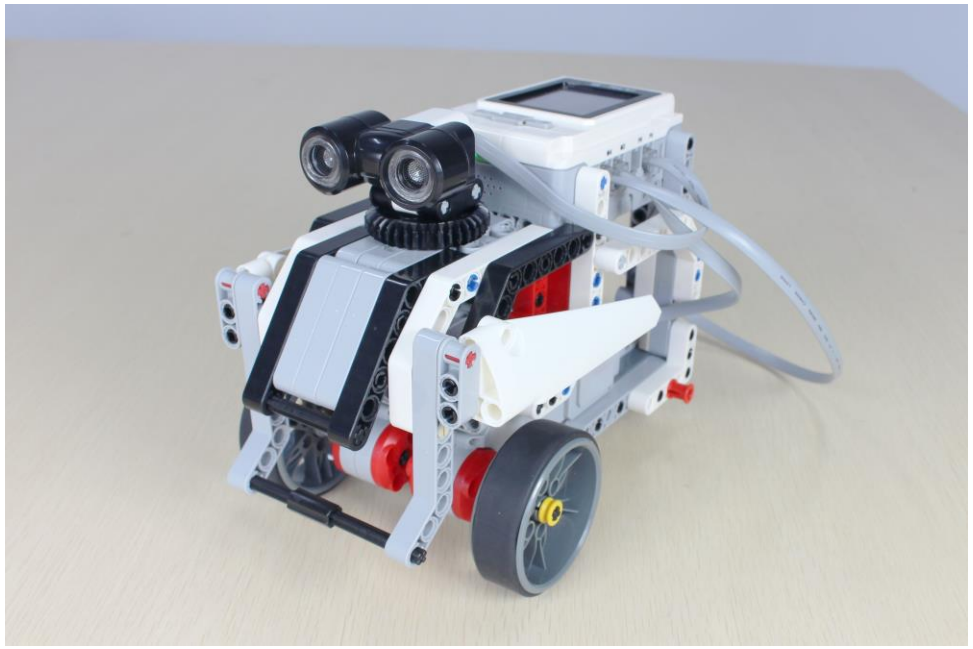
Measure turning angle of motors



Design Assembly



Design Assembly



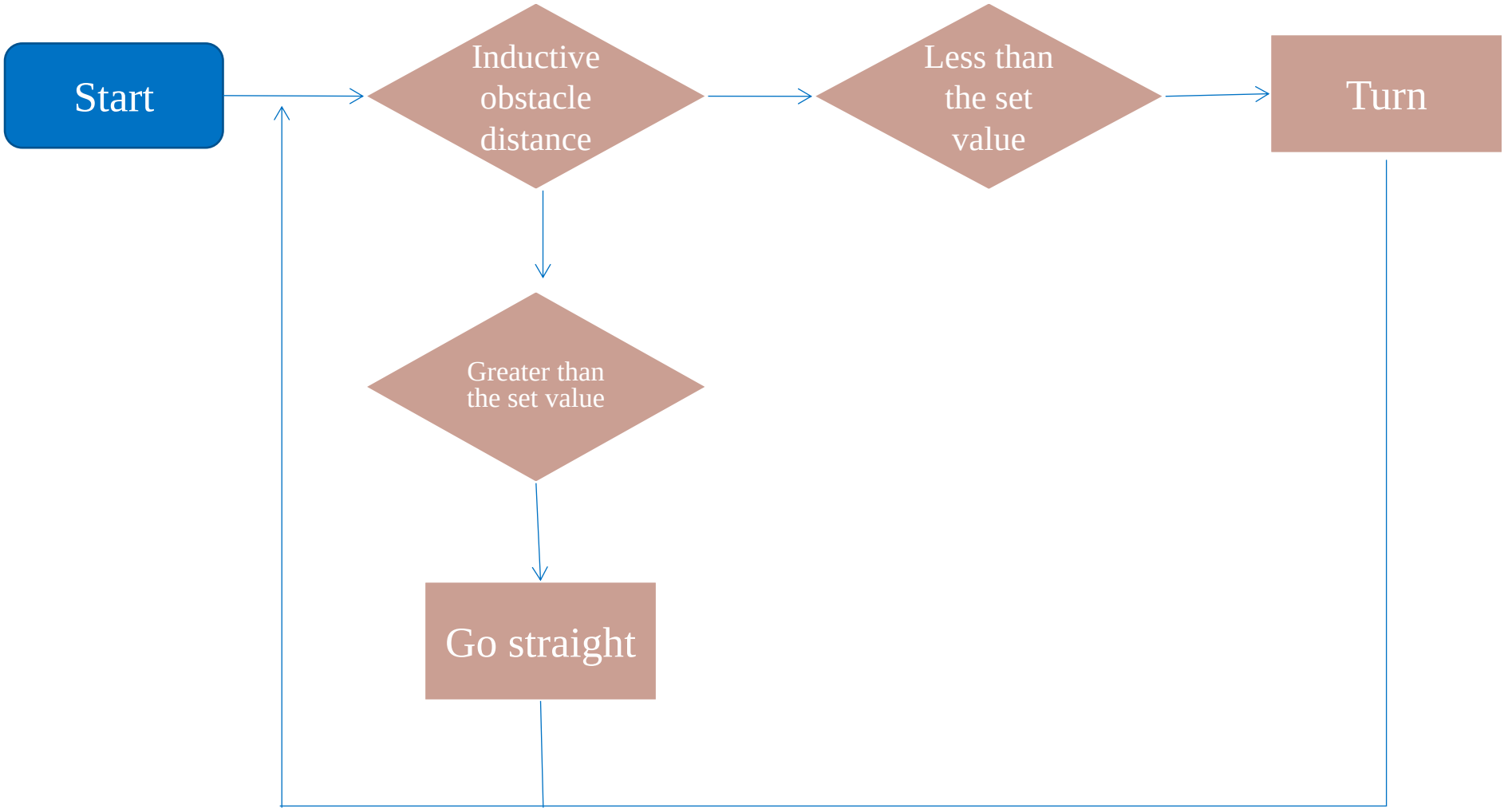
Assembly requirements

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

Programming and Debugging



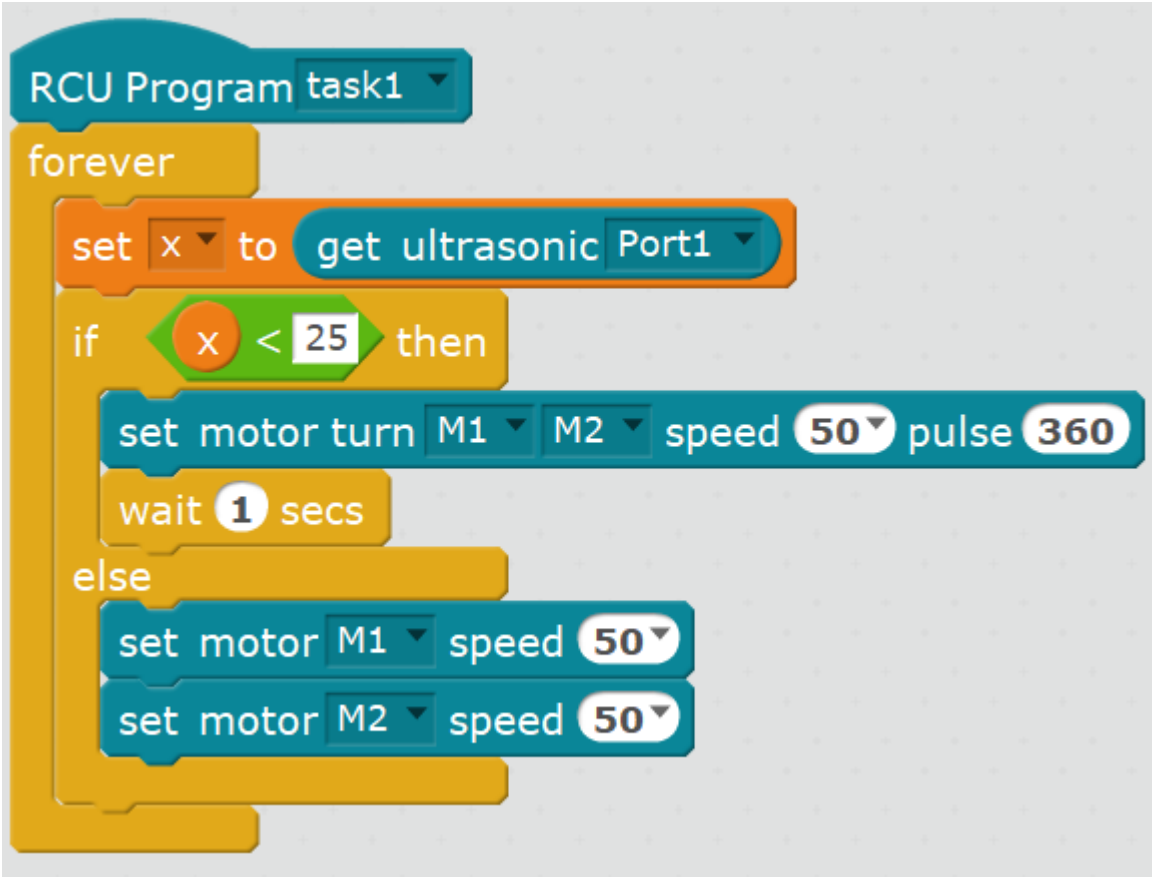
Programming and Debugging



Programming and Debugging

Task 1

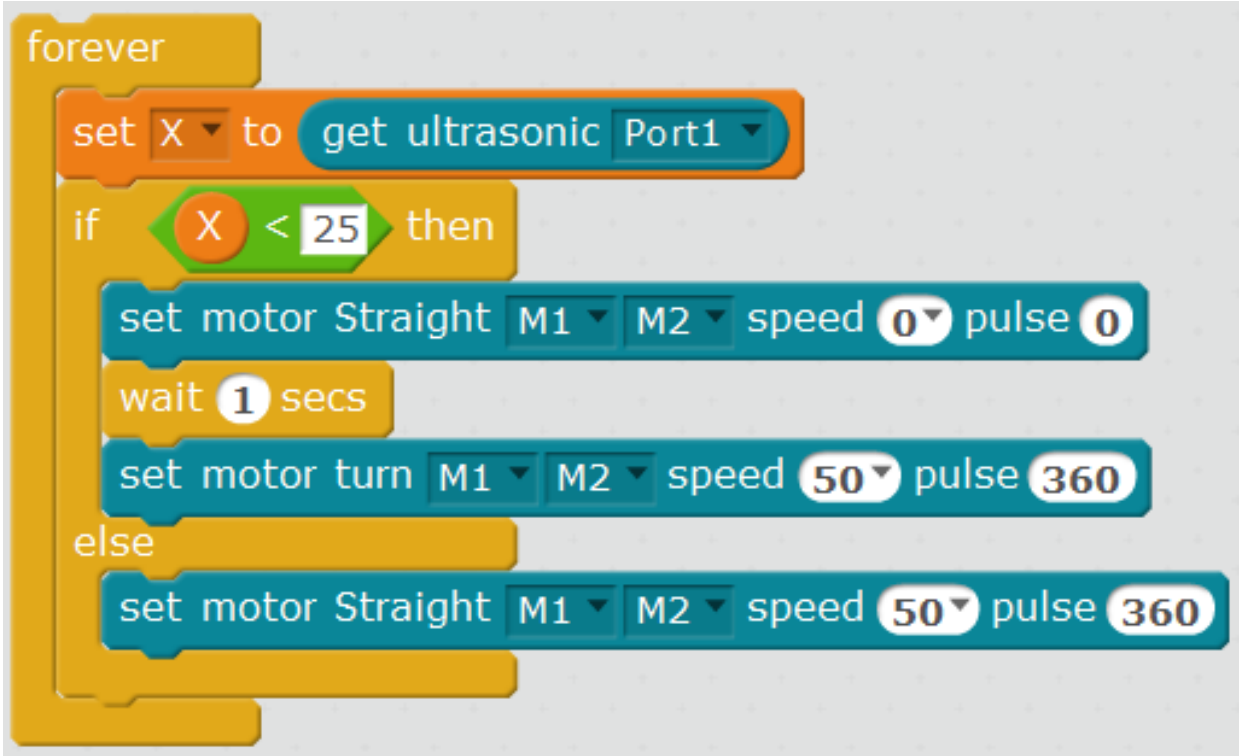
The ultrasonic trolley encountered obstacles in the front 25cm and turned straight to avoid.



Programming and Debugging

Task 2

The ultrasonic car stops for 1 second when it encounters an obstacle at 25cm in the front, and turns 90 degrees to the left to continue.



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

