Robotics Learning Series

Obstacle avoidance robot 2



Developed by Joinmax, this building-block robot uses modular parts to construct its body, while programming software and sensors enable a range of interactive 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

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Learning focus

Using the principle of ultrasonic ranging distance change, the specified action command is completed.

02

Learning difficulties

The ultrasonic distance test completes the task program corresponding to the variable value according to the return value of the variable.

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Course Introduction



Course Introduction

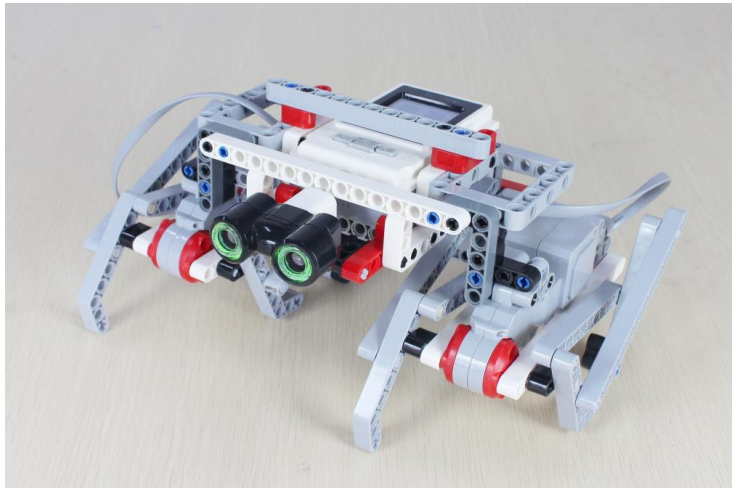
Reversing, please pay attention



Let's take a look at a picture and think about how the ultrasonics measure distance.

The ultrasonic transmitter emits ultrasonic waves in a certain direction, and starts timing at the same time as the emission time. The ultrasonic waves propagate in the air, and immediately return to the obstacle when they encounter an obstacle. The propagation speed of the ultrasonic wave in the air is 340 m/s, time t, distance (s), ie: s = 340 t/2.This is called the time difference ranging method.

Course Introduction



Obstacle avoidance robot

Obstacle avoidance robots

The ultrasonic robot determines the position of the obstacle based on the time difference of the received sound wave, and the robot makes different actions according to the distance of the position.

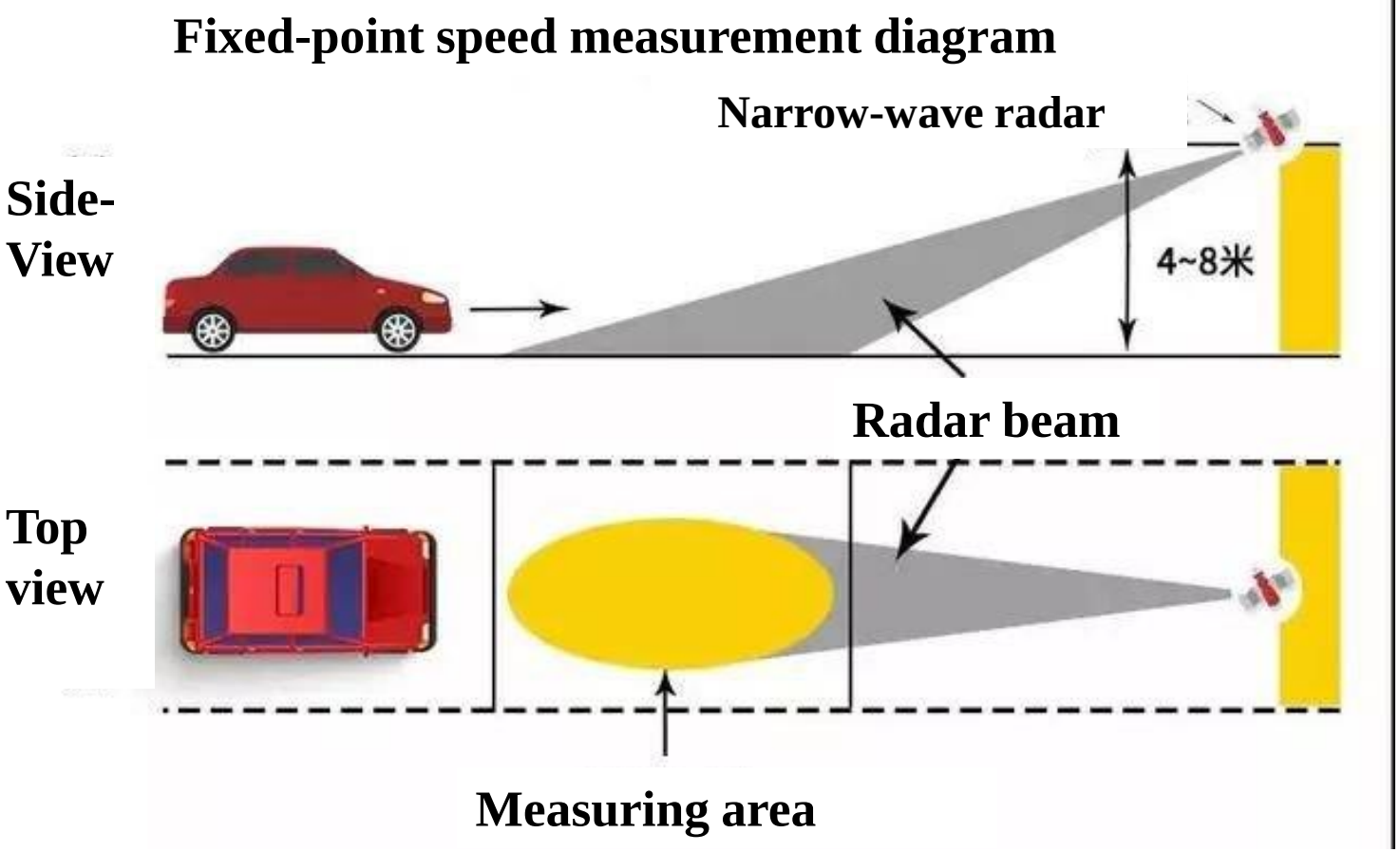
This lesson will build an obstacle avoidance robot.

It is a function that uses ultrasonic ranging.

Teaching New Knowledge



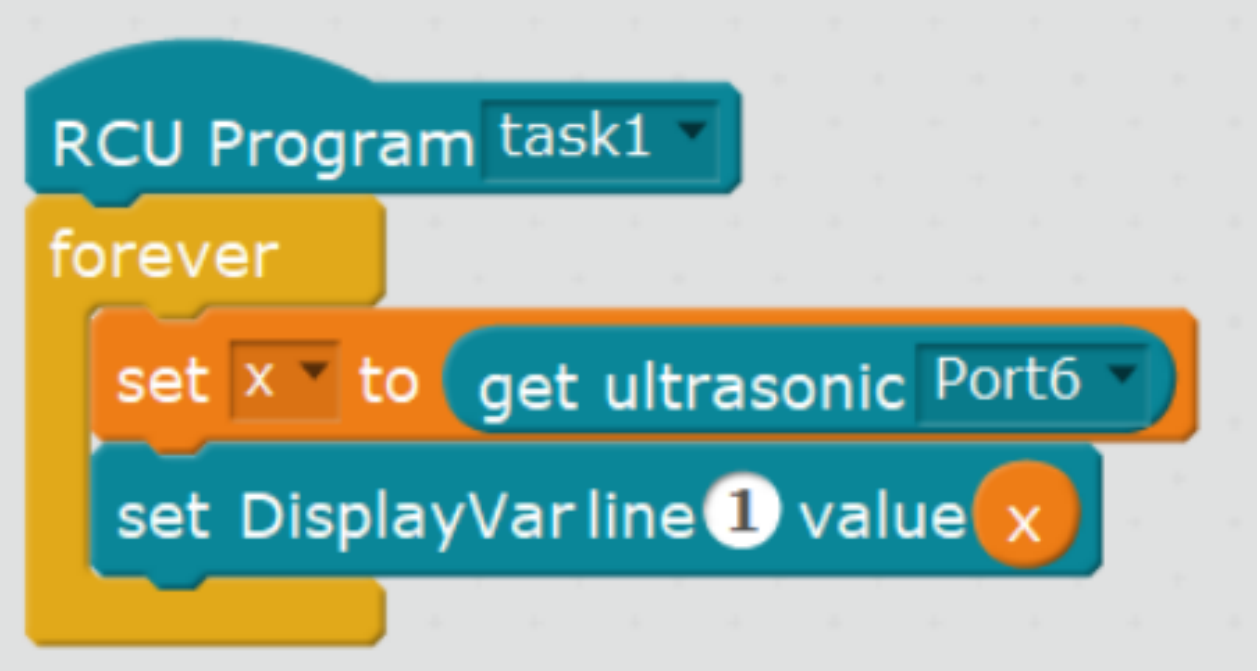
Teaching New Knowledge



In this lesson we need to measure the distance between the obstacles of the car.5-25cm,25-50cm,50-75cm

Teaching New Knowledge

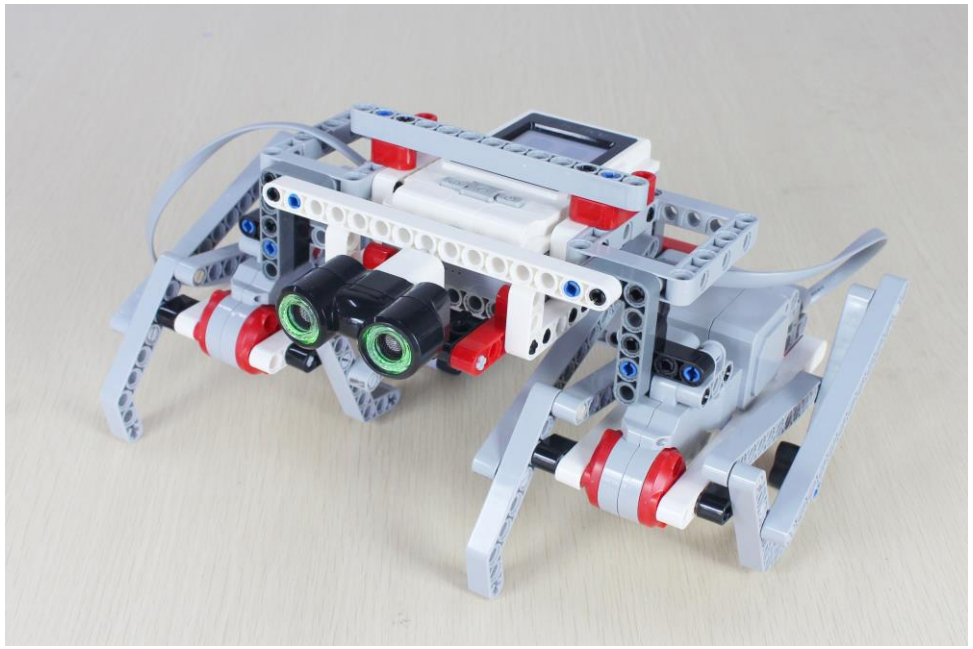
Measuring interval



Design Assembly



Design Assembly



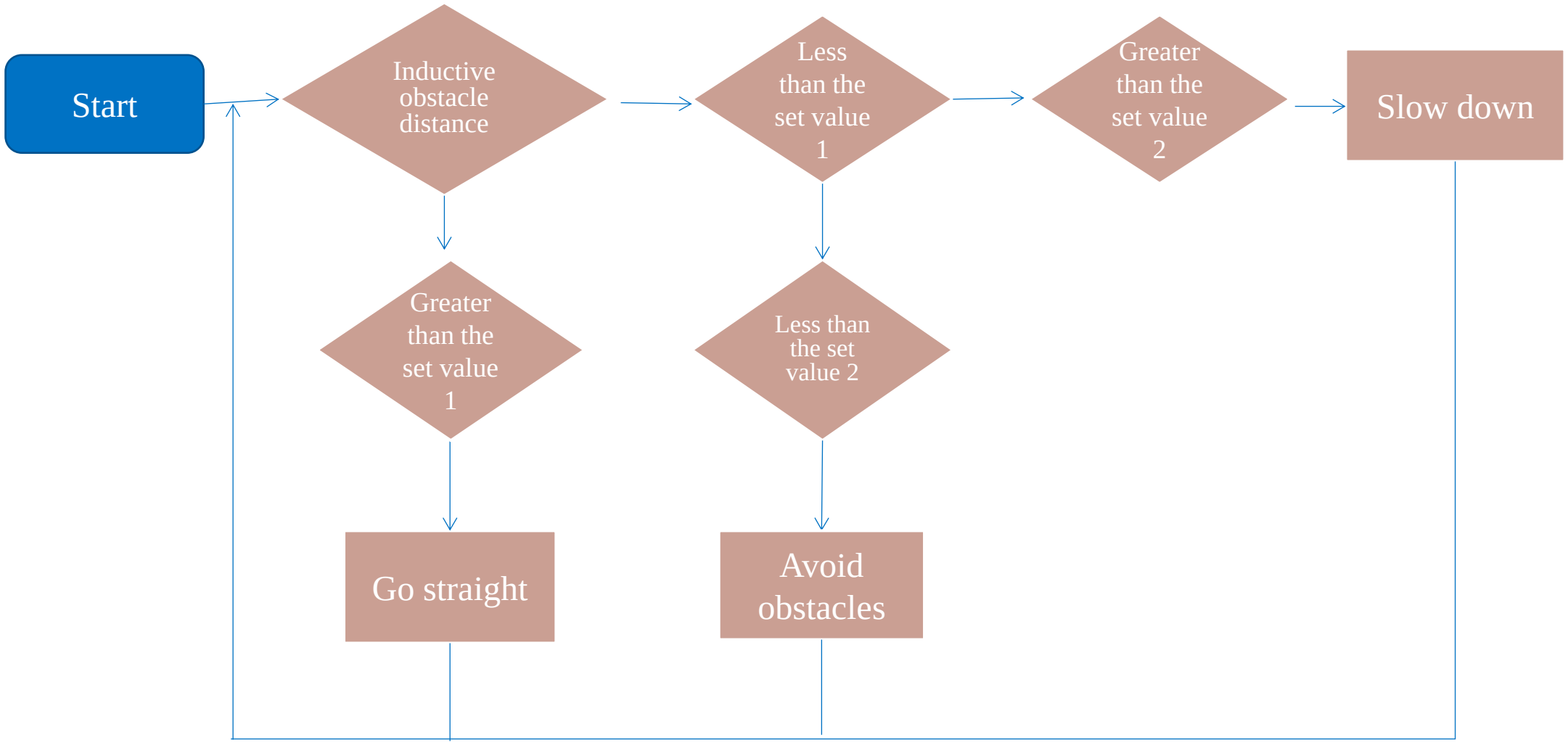
Assembly requirements

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

Programming and Debugging



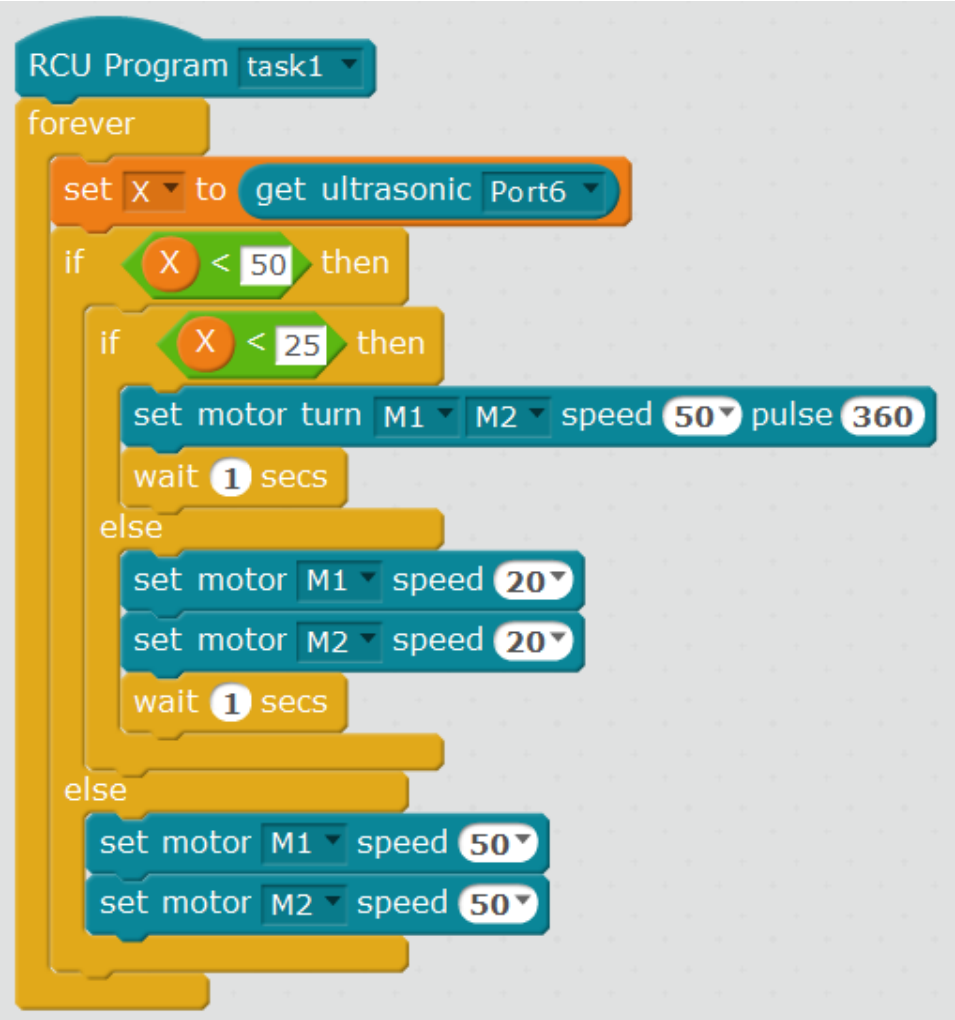
Programming and Debugging



Programming and Debugging

Task 1

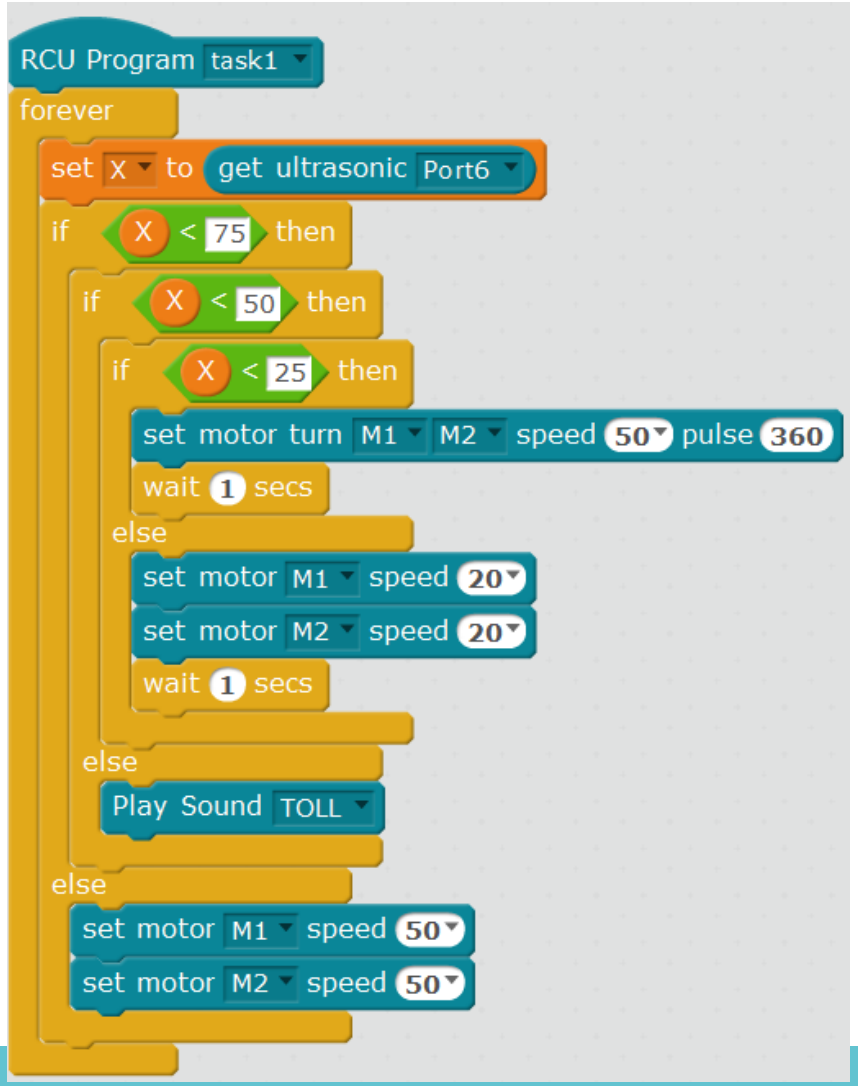
The trolley slows down when the distance to the obstacle is less than 50cm and avoids it when it is less than 25cm.



Programming and Debugging

Task 2

In the distance with the obstacles less than 75cm trolley sound alert, less than 50cm when slowing down, less than 25cm avoidance.



Checking Effect



Test Effect



Review the learning content and deepen your impression.

Question 1

What is the distance interval?

Question 2

The formula for avoiding obstacle ultrasonic measurement distance?

Question 3

Interval programming of the if module.

Thank you for watching

