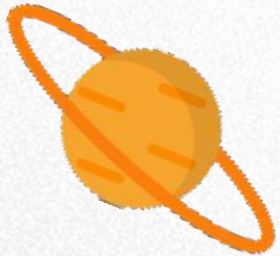


Qoopers series course

Section 11
《Scorpiod B》

Robobloq

Curriculum objectives

Knowledge and skill

1.Learn to use computer-end programming, learn conditional judgment statement and loop statement；

2.Learn to use programming application of ultrasonic sensor；

Process and methods

1.Through curriculum, learn programming statement, exercise students' logical thinking；

Emotional attitude and values

1.Stimulate students' learning interest toward physics by learning ultrasonic.

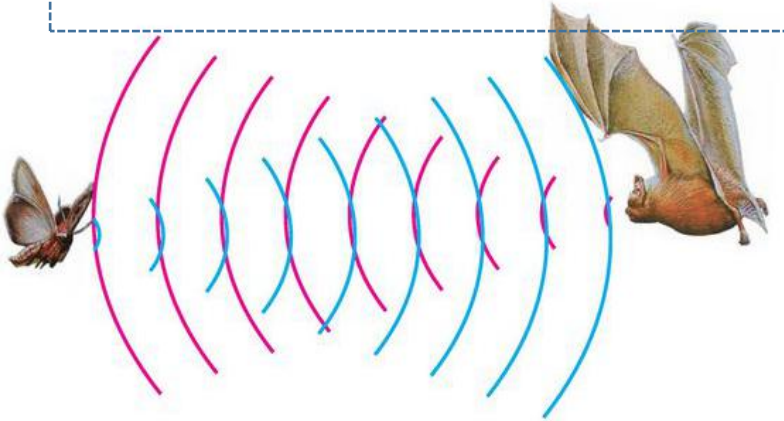
Robobloq

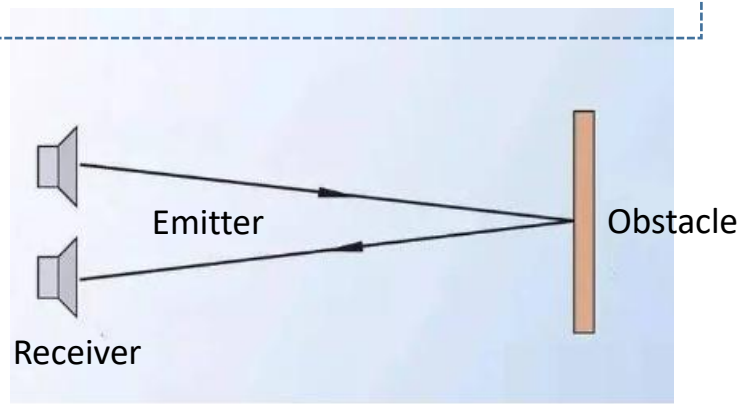
Curriculum introduction

When Scorpiod meet unknown obstacle in implementing patrol task in the evening, it will warn itself that " dangerous". At the same time, it can convey dangerous information by sound and light signal.

Popularize general knowledge

Scorpion is very fit for dark life, though its vision is weak, differentiate sound ability is very high, because its ear is ultrasonic positioning structure, relying on ultrasonic that itself sended to guide flying, if meet insect, ultrasonic will return to scorpion's ear to ensure prey location, then catch it.





Knowledge explanation

Roboblog

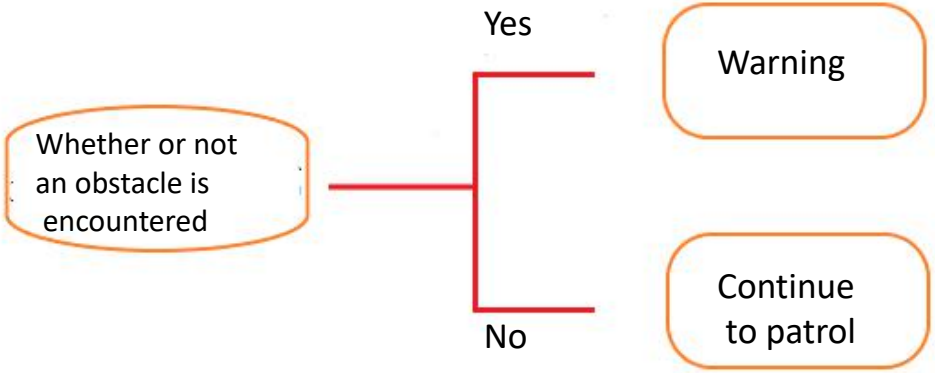
Ultrasonic sensor mainly consists of ultrasonic probe that installed RGB light and port that transmit signal.

One ultrasonic probe radiates ultrasonic, and another receive return wave. It will form return wave when meet obstacle after ultrasonic radiate to front, then return wave, which received by probe, transformed into electric signal that send to main control board to deal with through connection port.

Knowledge explanation

The effective detection distance of ultrasonic sensor is between 5cm -250cm, the closer distance between ultrasonic sensor and obstacle, the shorter is the effective detection distance.

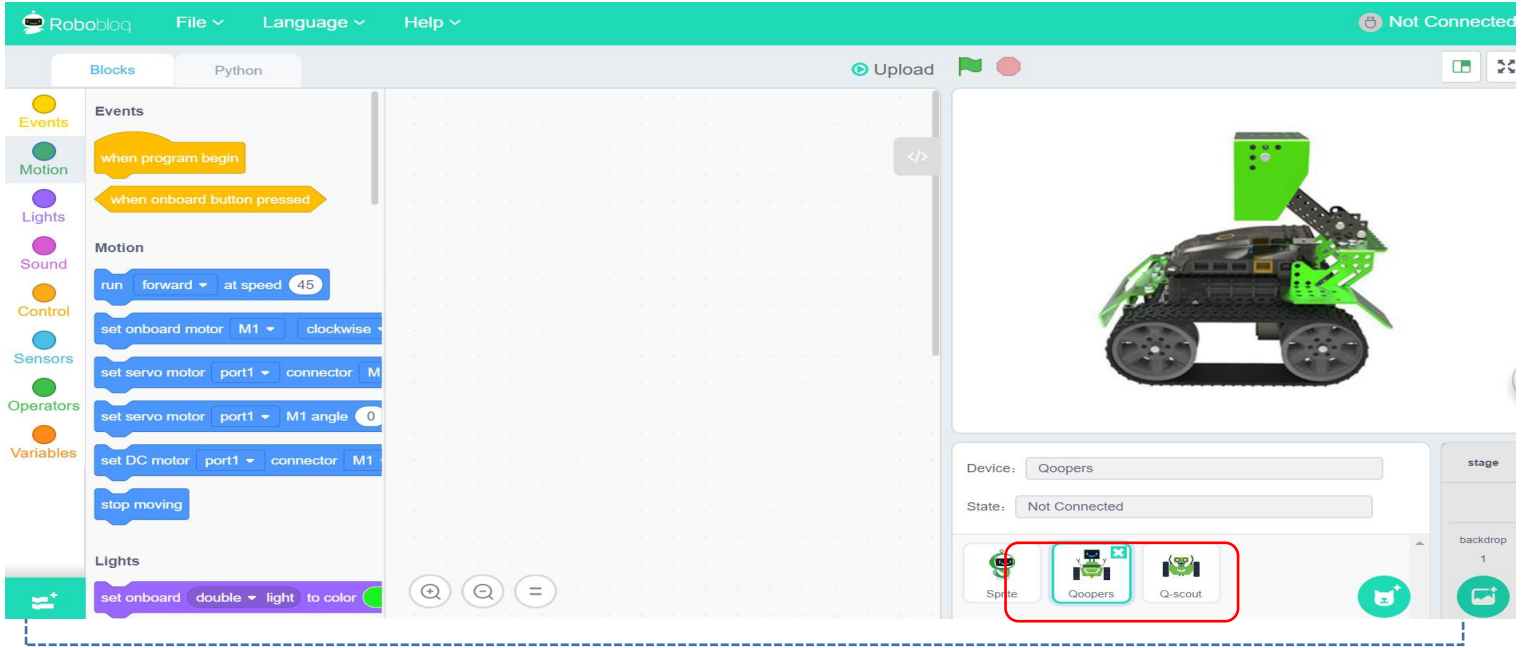
Knowledge explanation



Scorpiod's ultrasonic sensor constantly operate while patrolling, and the function is that help scorpiod see obstacle clearly in the evening, judge whether the condition that "whether or not an obstacle is encountered" is right, and response relative command action on the basis of that condition.

Knowledge explanation

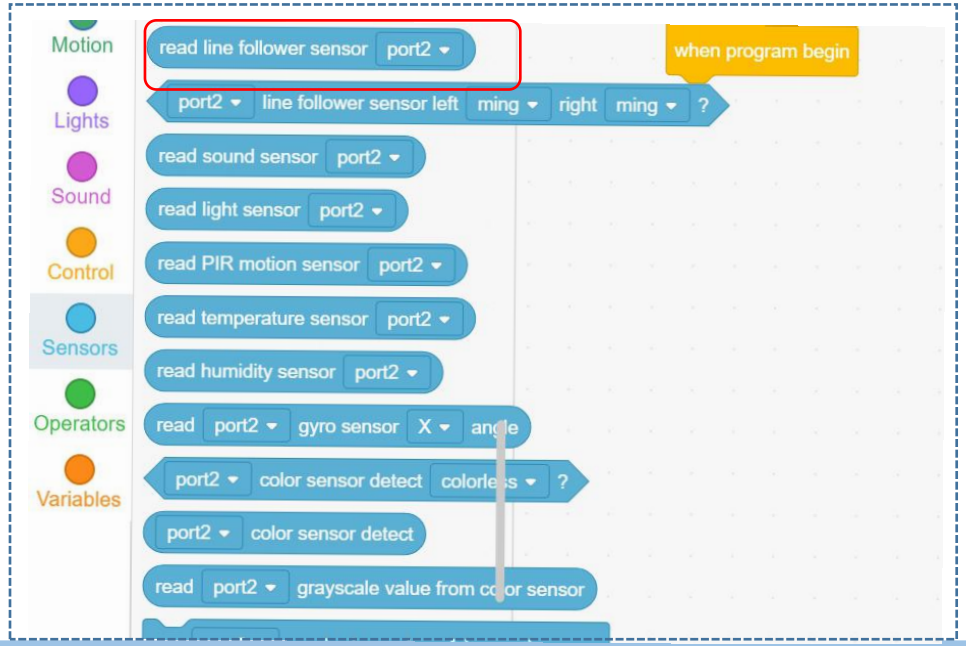
We will learn programming with computer-end software. Open programming software, choose "Qoopers" icon on the lower right corner of interface to get in Qoopers programming.

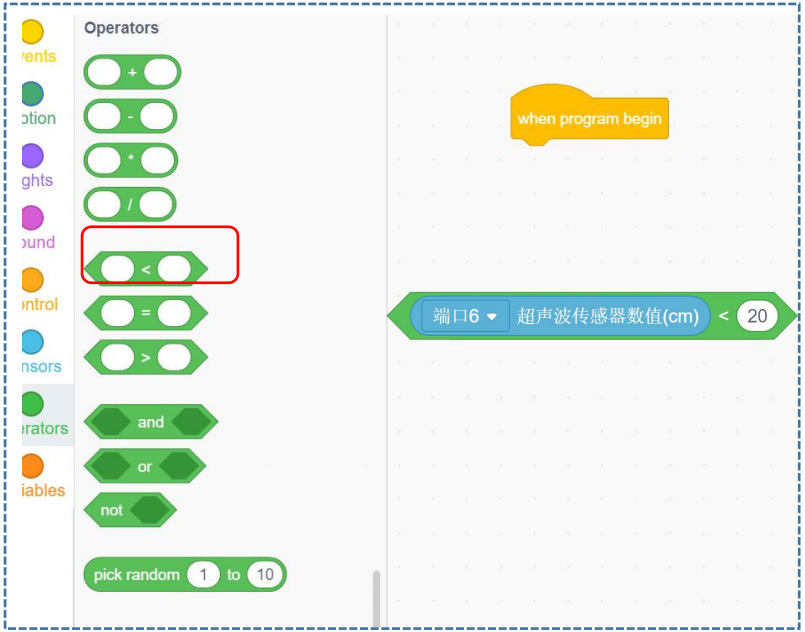


Knowledge explanation

Roboblog

In actual programming, we also need to set the condition of ultrasonic detect distance.Choose. read ultrasonic sensor port2 in the sensor of icon module; Choose. < in the operation to set condition of ultrasonic sensor.

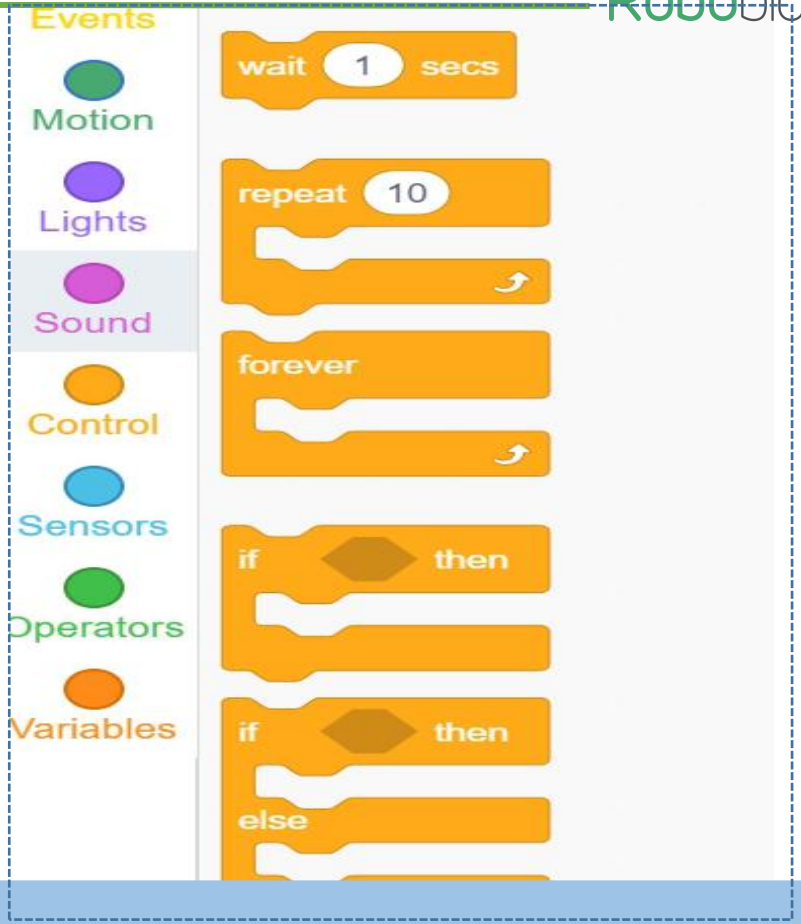




Programming

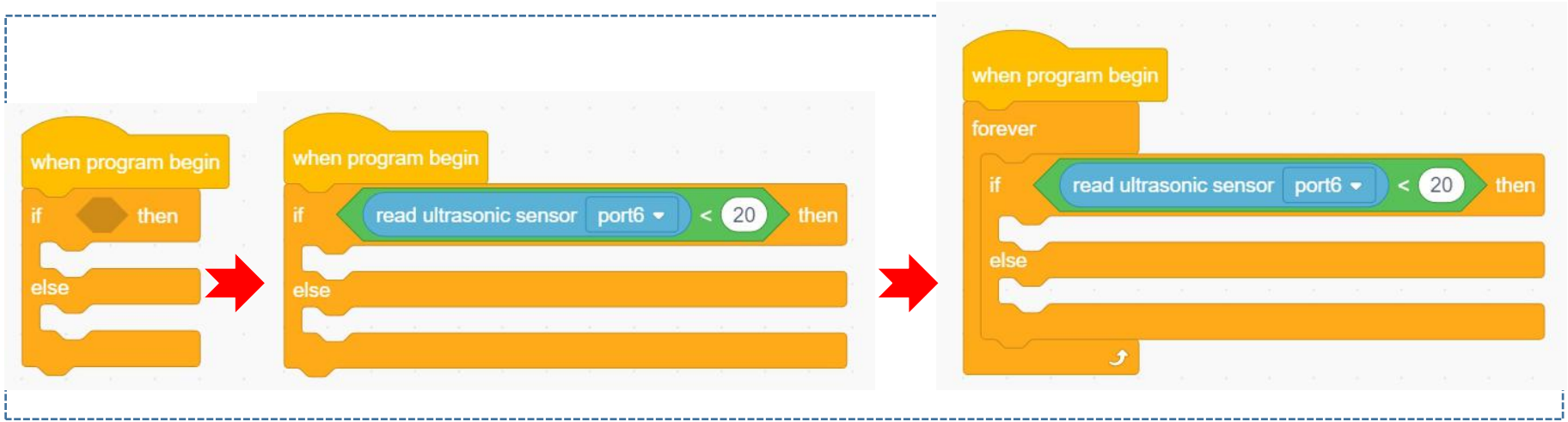
The procedure of patrol task need to use conditional judgment statement and loop statement.

In the icon module area, conditional judgment statement includes "if…then…" , "if…otherwise…"； loop statement includes "implement repeatedly ( ) times", "implement repeatedly."

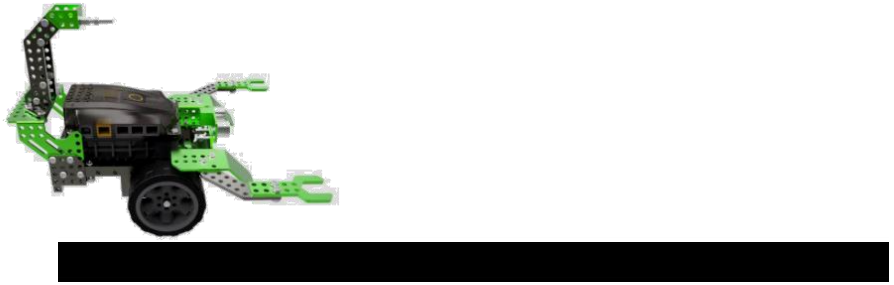


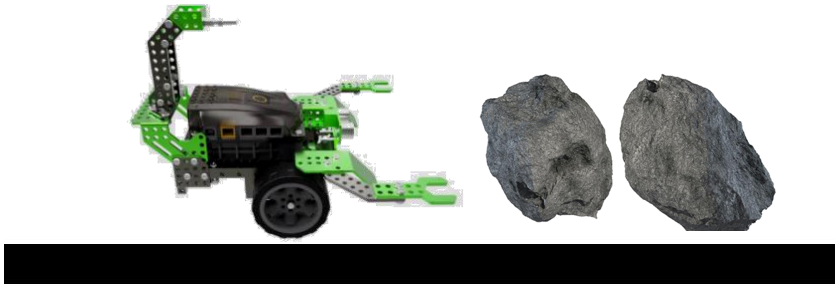
Programming

The complete procedure need to add "condition" in the conditional judgment statement, and detect the condition circularly to judge whether it or not right.



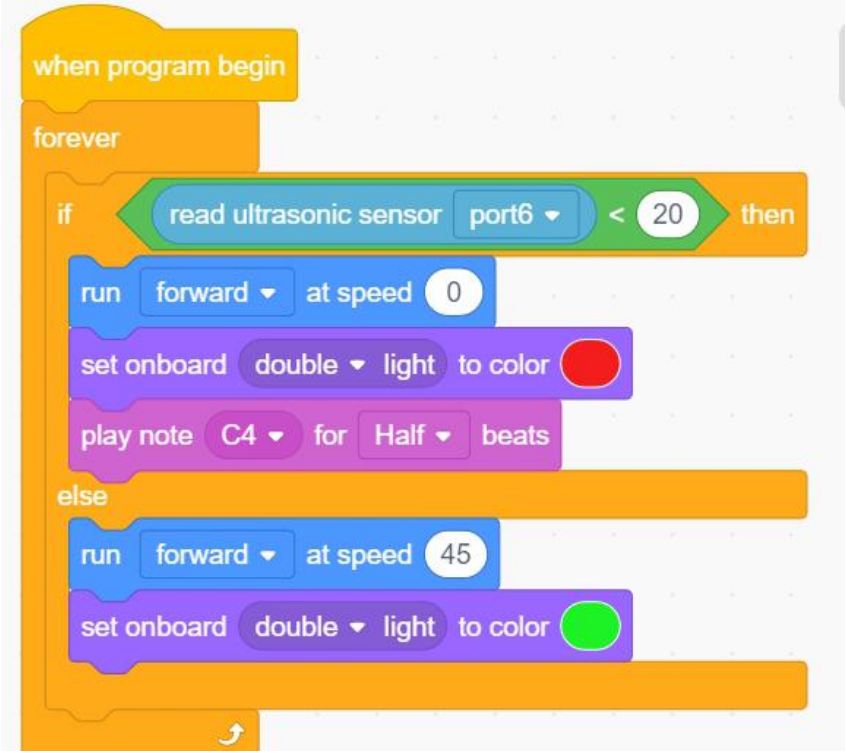
Programming





Scorpiod patrol in the route when condition is normal, but when it encounter unknown obstacle, ultrasonic sensor return signal and send dangerous signal.

Programming



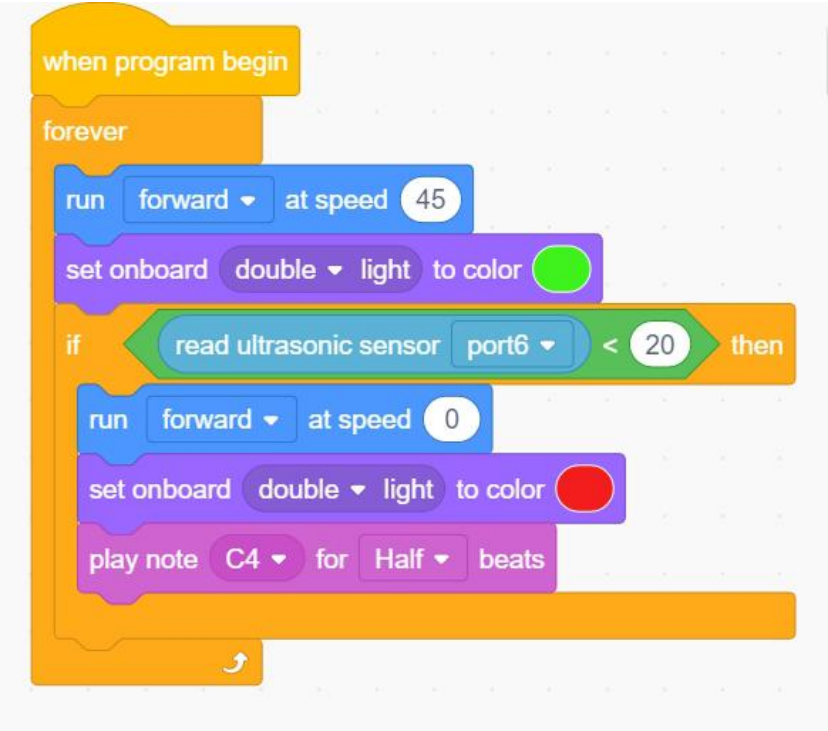
Programming：

1.Set suitable distance condition of ultrasonic sensor, notice that the connection between sensor and port are corresponding；

2.When setted condition is right, that is to say when encountered obstacle, Scorpiod stop motion, then light red lamp and phonating；

3.If condition is not right, scorpiod move normally.

Extends



Compared that what is the difference between left program and before program, and are their operation effect same?

Summary and rethink

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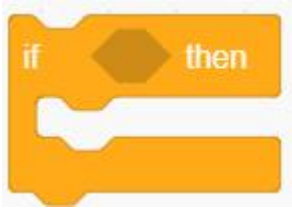
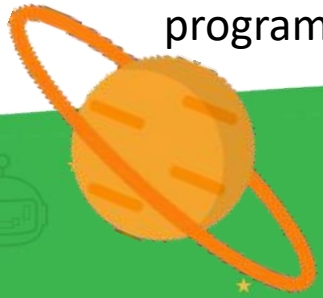
1.Why ultrasonic sensor could detect the distance between it and obstacle?

2.Analysis that what is the distinction between "if… then…" and "if… otherwise…" these two statements in terms of usage in the programming.





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