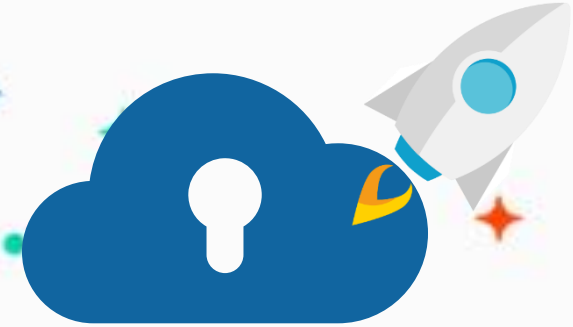

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Lesson 1. Scan to Open the Gate

LECTURER:

Lesson Objective

Learning Objectives

1. Learn about the scanning camera.
2. Learn about the QR code.

Possible Difficulties

1. How to use the scanning camera.
2. The value of the scanning camera.



Background Information



Background Information



In modern life, QR codes may be used to buy a product or open a website. But have you ever wondered why QR codes can do so many things? A small QR code can do so many things, but why do we have to make this code like this?

Background Information



In the beginning, barcodes were only used to solve the problem of automatically recording commodity sales in supermarkets. Only in recent years have they become so versatile.

Limited by the production level in 1948, the computer could not directly recognize the numbers. Strictly speaking, it was very difficult to scan in black and white. Bernard Silver and his friend Joseph Woodland have worked hard for more than 20 years, from designing barcodes to making laser barcode scanners, and finally completed this familiar barcode scanning system.

Background Information

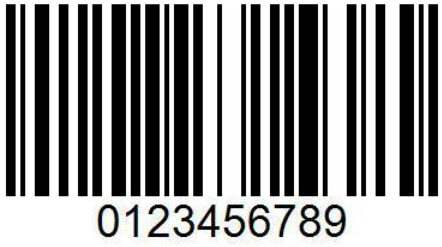


Today, we will use the scanning camera to make a common gate in the parking lot. When the specified QR code is scanned, the gate will be opened and closed after a period of time. When other QR codes are recognized, the light will be on to indicate that the QR code is invalid.



Knowledge Introduction

Knowledge Introduction



A barcode or bar code is a method of representing data in a visual, machine-readable form. Initially, barcodes represented data by varying the widths, spacings and sizes of parallel lines. It is arranged according to certain coding rules to express a set of information.

Knowledge Introduction





Bar codes can contain many information such as the country of production, manufacturer, commodity name, production date, book classification number, mail start and end location, category, date, etc., so it is used in many fields such as commodity circulation, book management, postal management, banking system have been widely applied.

Knowledge Introduction



The full name of the commonly used QR Code is the Quick Response code, which can be understood as a QR code that can be quickly recognized. It is a popular coding method on mobile devices in recent years. Complete information can be identified. It can store more information and represent more data types than the traditional Bar Code.

Scanning Camera



The scanning camera is a camera that can scan and quickly identify QR codes and barcodes. Decodes barcodes and QR codes in various formats. The scanning range is about 5-18cm. It can only be connected to the P8 port of the E6 controller.

Scanning Camera

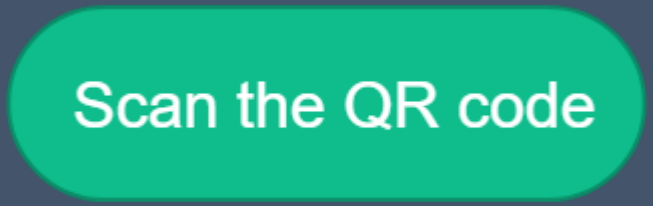


How the scanning camera works

The scanning camera scans the barcode by emitting a laser light source, and the module decodes and recognizes it after receiving the light reflected from the black and white bars.

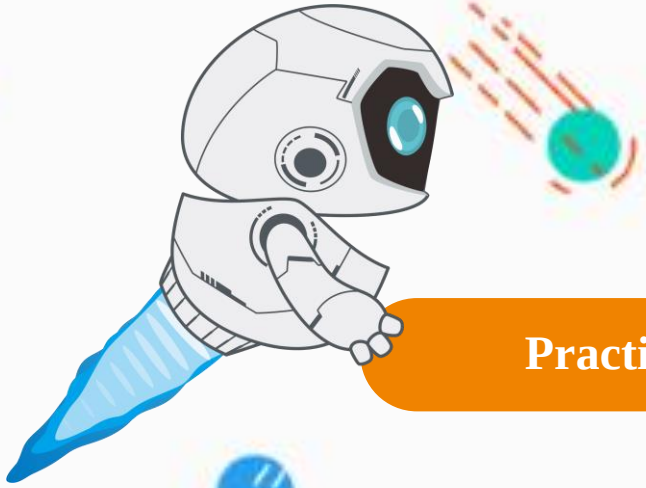
Scanning Camera





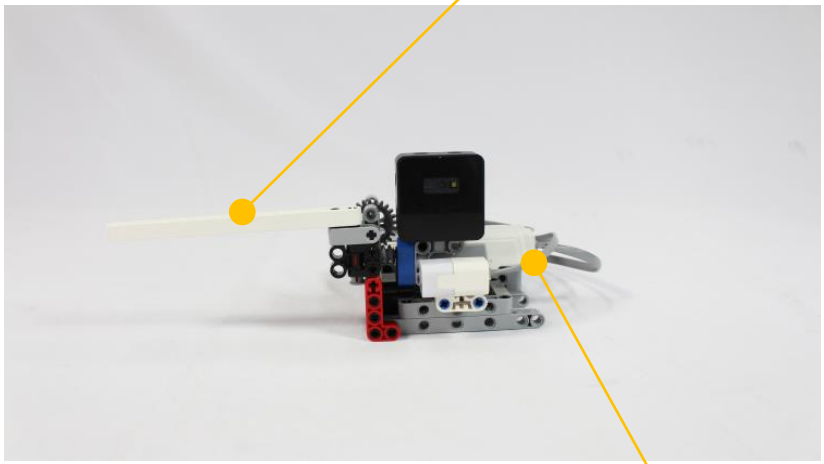
It is used to scan the QR code to obtain the value contained in the QR code.

Return value: 0-255, corresponding to the QR code ID value.



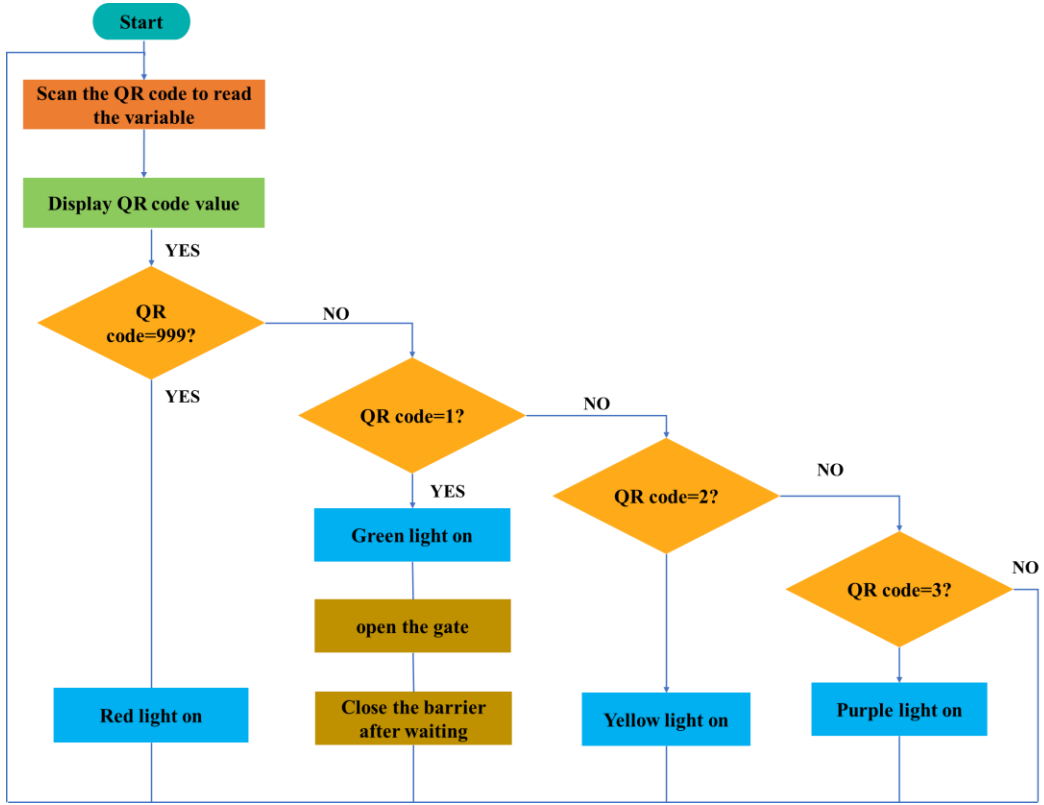
Practice

New Knowledge



Build a barrier gate according to the construction manual to realize the function of scanning the code to open the gate.

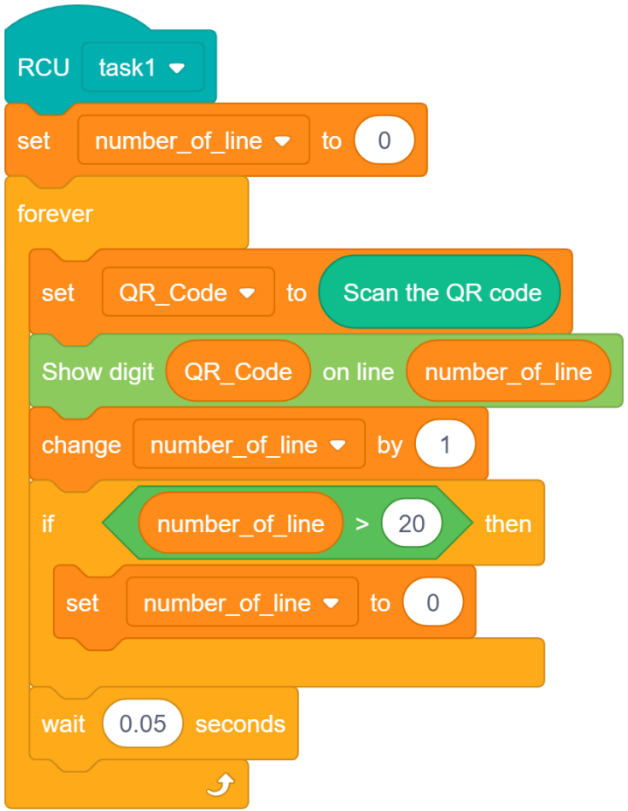
Practice | Flow Chart



After a specific QR code is recognized, the gate is opened, and the other QR codes light up the error indicator light.

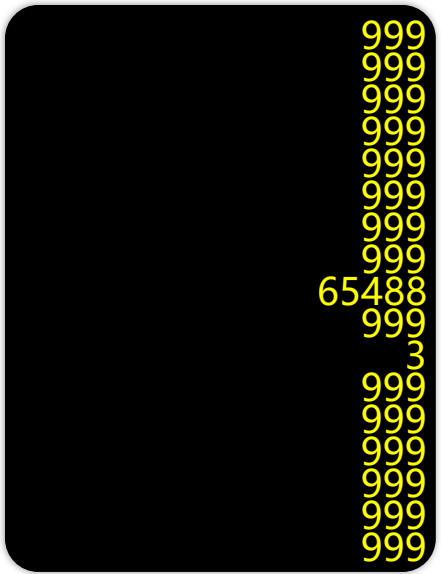
It is necessary to test whether the value of the QR code is consistent with the expected situation.

Practice | Programming



Test value

The data of the scanning camera will be displayed downward every 0.05 seconds, and it will loop to the first line after 20 lines.

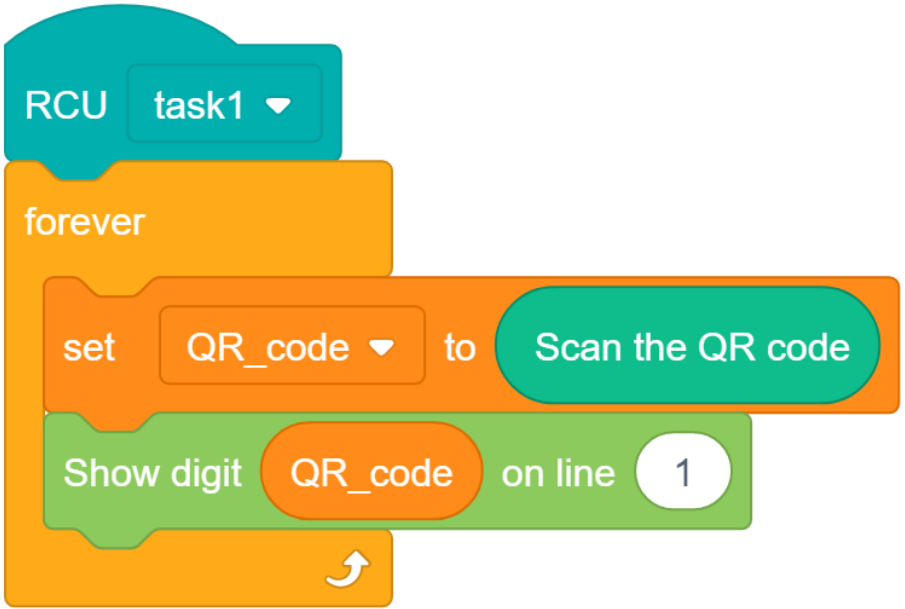


Test value

The test scan code shows that 999 will be displayed when the QR code is not detected, and 65488 will be displayed after the QR code is detected, and then the value of the QR code will be displayed.

The 65844 here is the end code of the QR code, which has no practical meaning and can be ignored, but you should pay attention to the interference it brings when programming.

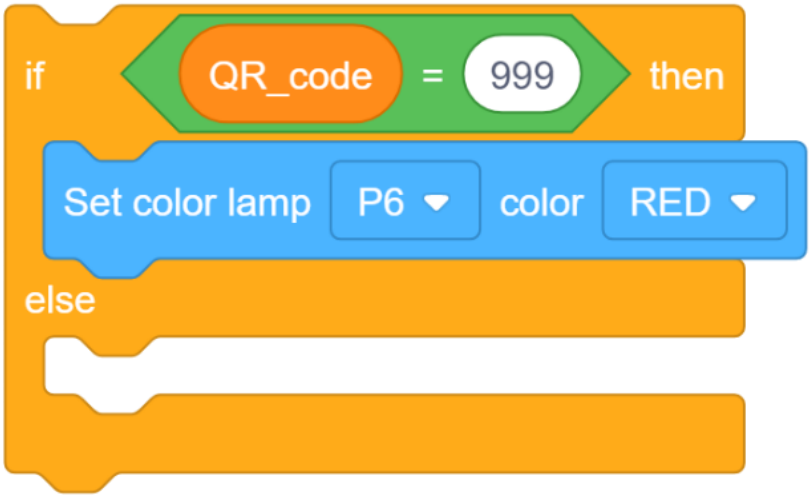
Practice | Programming



Display value

Data is read repeatedly and displayed on the screen.

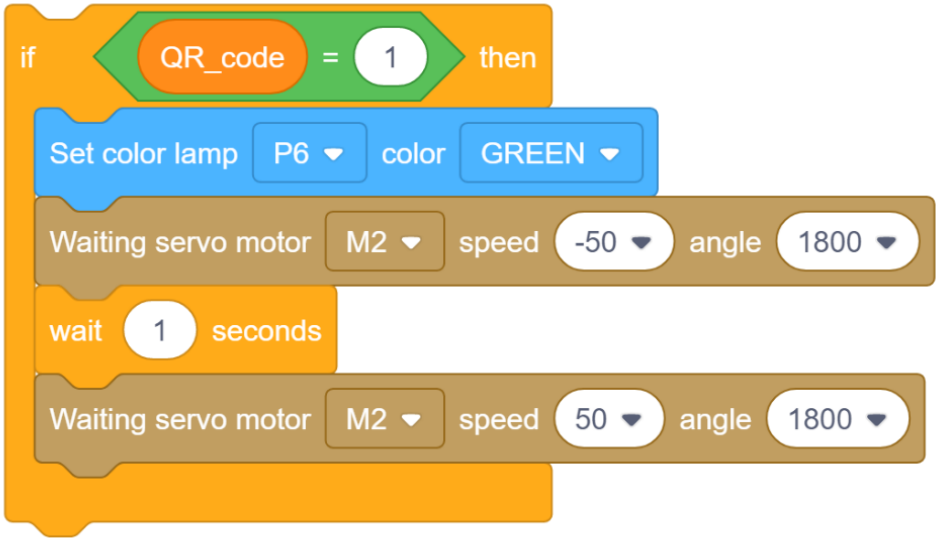
Practice | Programming



Data not identified

When the data is not recognized, the QR code data is 999, and the red light at this time means that passing is prohibited.

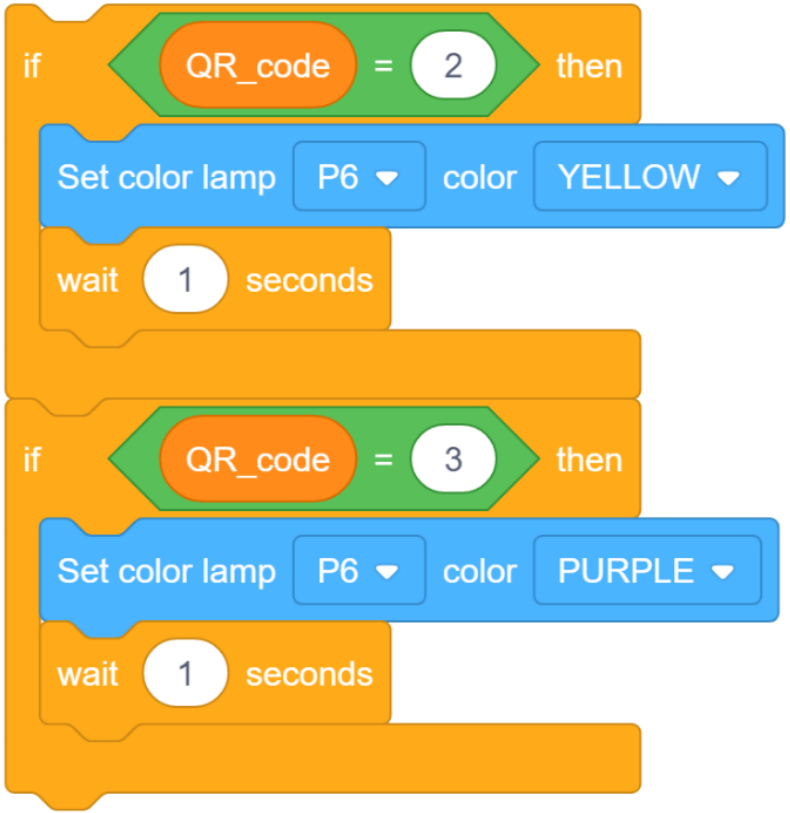
Practice | Programming



Judgment of the data

When the QR code is recognized as 1, the motor rotates, lifts the railing, waits for one second, and then drops the railing.

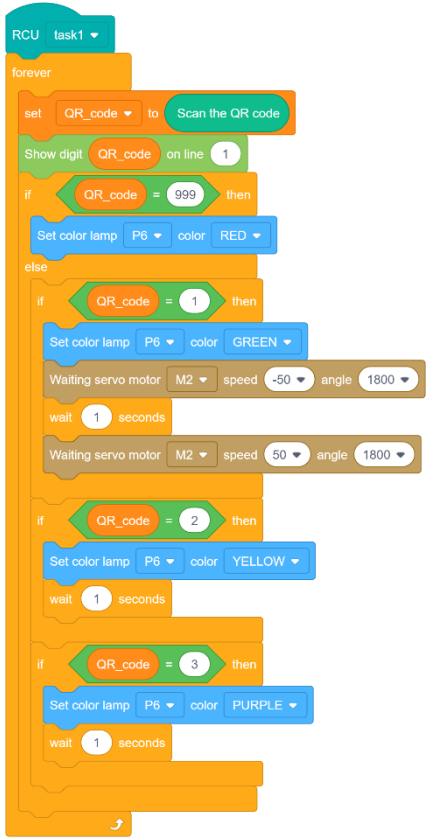
Practice | Programming



Judgment of the data

When the two-dimensional code is recognized as 2 or 3, a yellow or purple light is displayed, and the lighting time is 1 second each time.

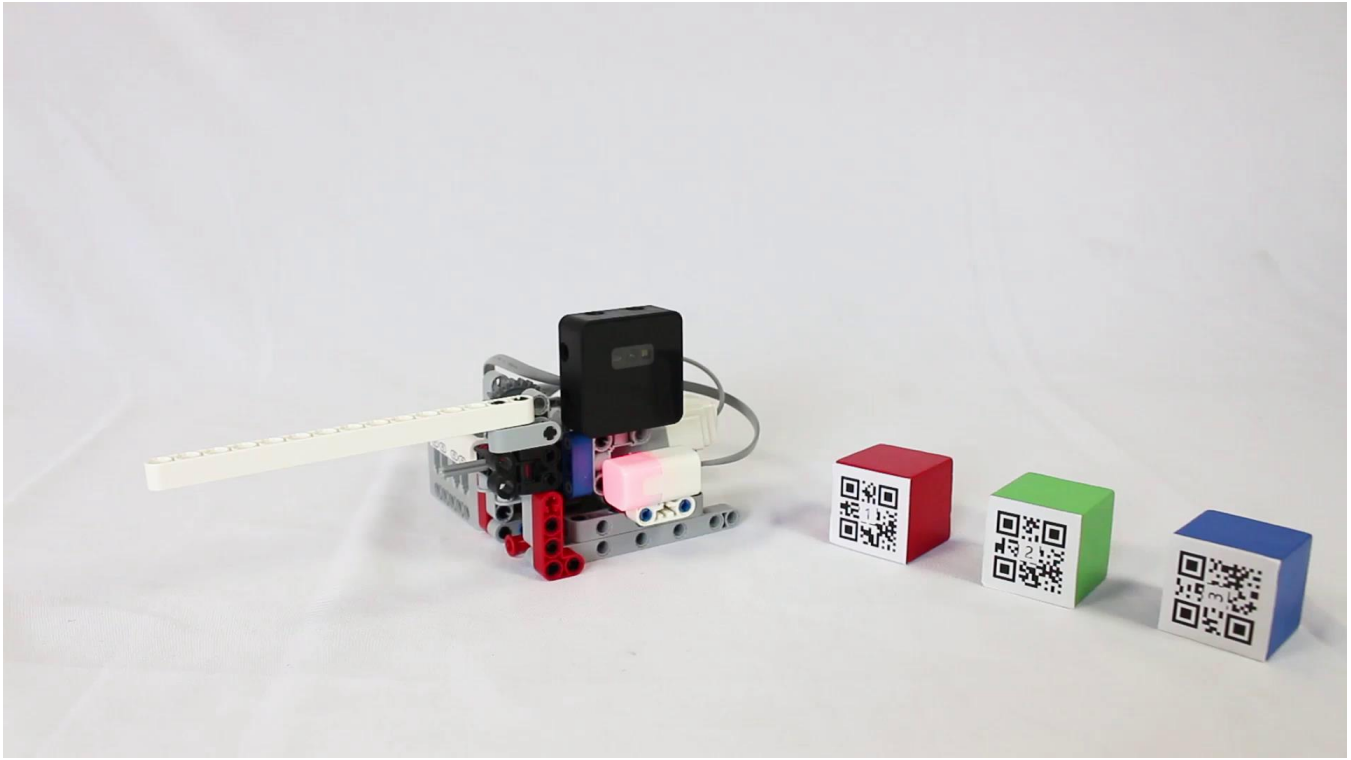
Practice | Programming

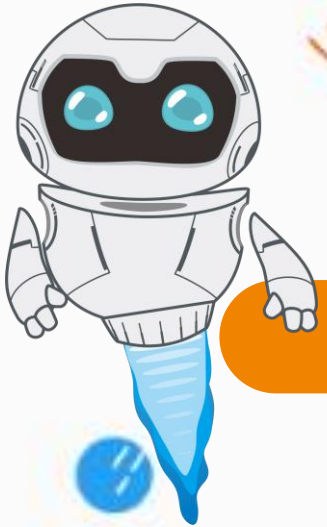


Integrate the program

According to the flowchart, integrate each segment of the program.

Practice | Programming





Results

Program Optimization

In this lesson, when the QR code No. 1 is recognized, the barrier gate is opened, and the QR codes No. 2 and 3 only light up the indicator light.

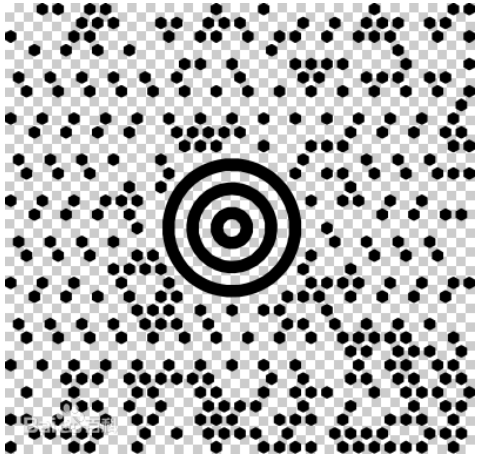
Next, modify the program to prohibit the No. 3 QR code from passing through the gate.

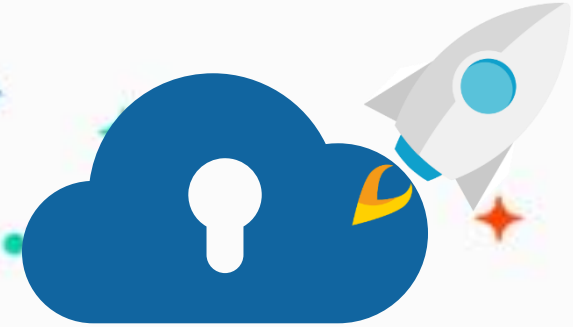
Requirements: Change the data judgment, when the value of the QR code is 3, the light will be on for prompting, and the door will be opened for other values.

Further Reading

In addition to QR Code, there are other two-dimensional codes, such as: Data Matrix two-dimensional code, which is used for small labels and small parts, and can be placed in a very small position. Maxicode QR codes are used by courier companies for express services. QR codes of different code systems have obvious style characteristics.







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Thanks!

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