Lesson 21. Lucky Prize Wheel

LETURER:

Lesson Objective

Learning Objectives

1. Learn about the principle of gesture recognition.
2. Know how to control the rotation of the lottery machine with gestures.

Possible Difficulties

1. Gesture recognition has certain requirements for the gestures made.
2. The relationship between random number and rotation position.



Background Information



Context Import



On some important occasions, in order to ensure fairness and justice, the form of random drawing will be used to draw or select numbers. Such a machine is called a lottery turntable machine, and there are many styles of lottery machines, such as lottery, ball rolling, turntable and so on.

Context Import



With the development of science and technology, the spin prize wheel is easier to be accepted by everyone because it can directly present prizes and attract attention.

Today we will use gesture recognition to make a spinning lottery machine.



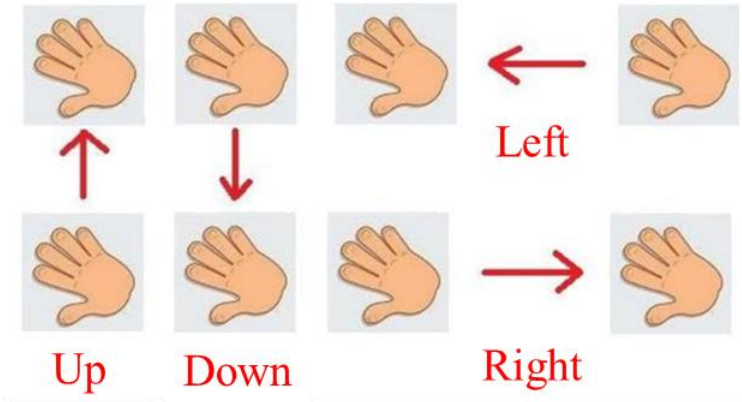
Knowledge Introduction

New Knowledge | Gesture Sensor



A gesture sensor is a sensor capable of detecting hand gestures. It can detect 8 gestures at a distance of about 3-10cm from the sensor, and return numbers 1-8. Different return values represent different gestures.

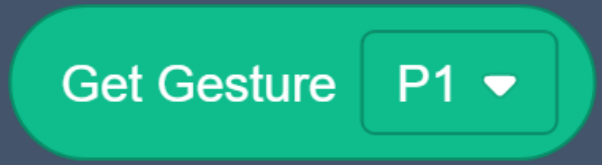
New Knowledge | Gesture Sensor



The sensor has built-in light source and ambient light suppression filter integrated LED, lens and gesture sensor are integrated in a small cube module, which can work in dark or low light environment. When the human body makes a gesture, it judges the gesture according to the direction of the light reflected by the hand.

It can recognize 8 gestures (left, right, down, up, forward, back, clockwise, counterclockwise), and supports interrupting the result with the output gesture.

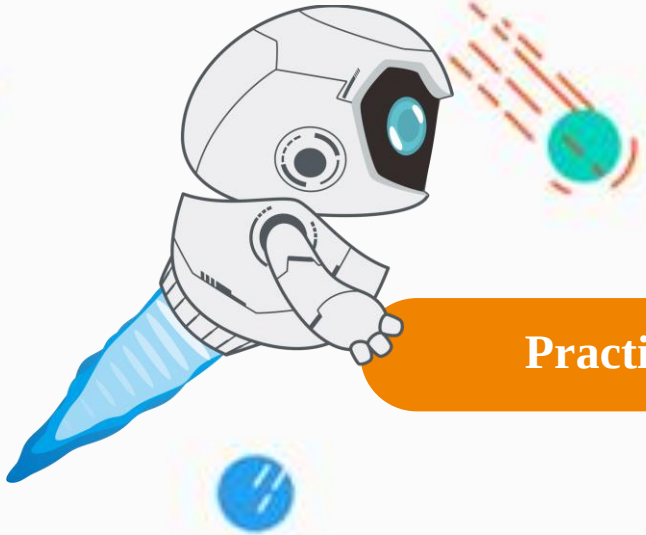
New Knowledge | Gesture Sensor



Read the gestures recognized by the gesture sensor

Parameter value: 1-8, sensor connection port
Return value: 0-8, different gestures correspond to different values

Tips:
0 (no gesture detected),
1 (wave left),
2 (Wave right),
3 (Wave down),
4 (Wave up),
5 (Wave forward),
6 (Wave backward),
7 (Wave clockwise),
8 (Wave counterclockwise)

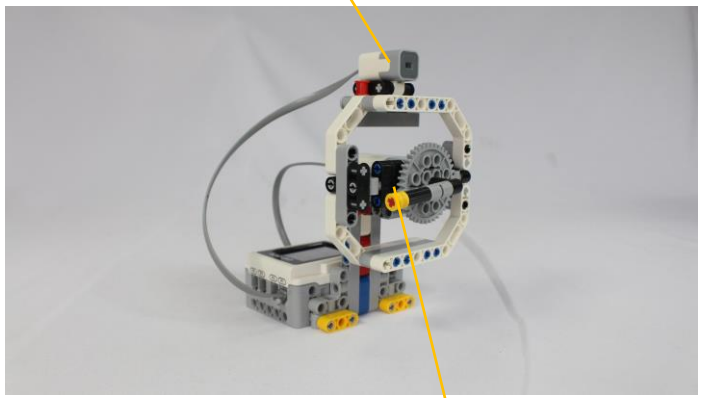


Practice



New Knowledge

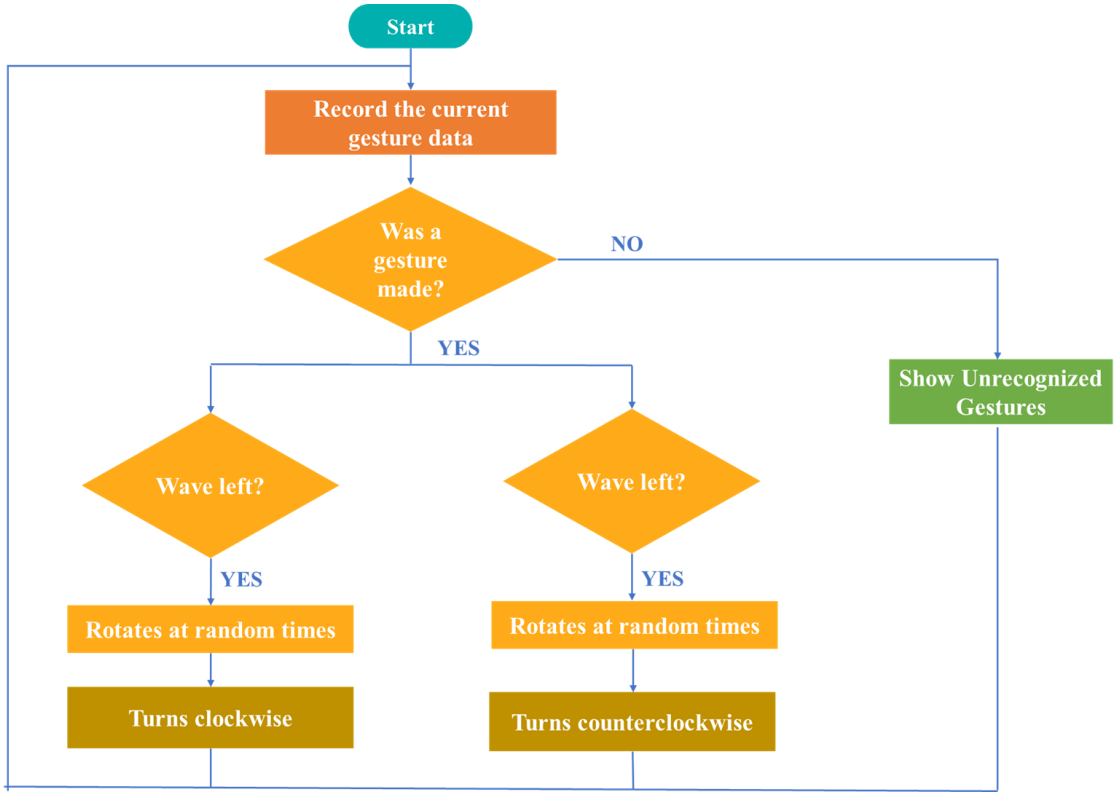
Gesture sensor



Pointer for lottery draw

Assemble a lottery machine according to the construction manual, and control the pointer to rotate in different directions under different gestures.

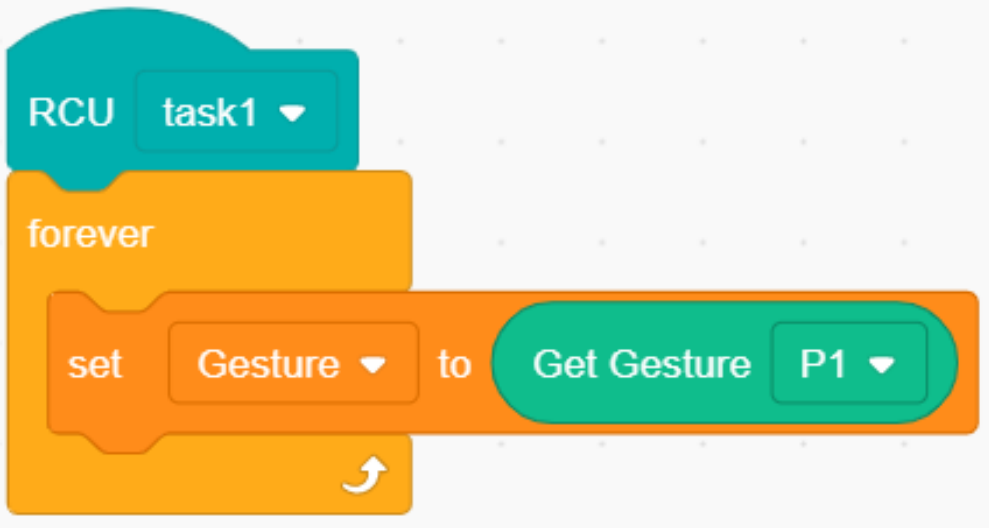
Practice | Programming



The gesture lottery machine can recognize different gestures and rotate according to different gestures.

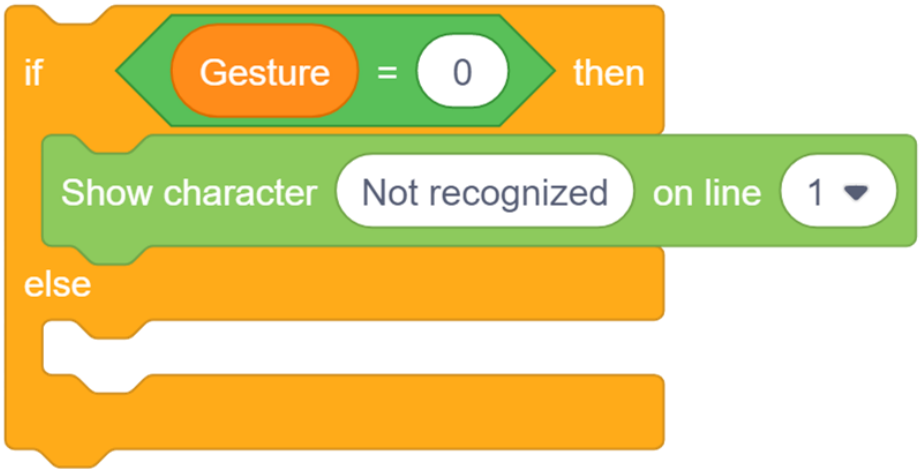
If it recognizes a left wave, it will turn clockwise, and if it recognizes a right wave, it will turn counterclockwise.

Practice | Programming



Get the information

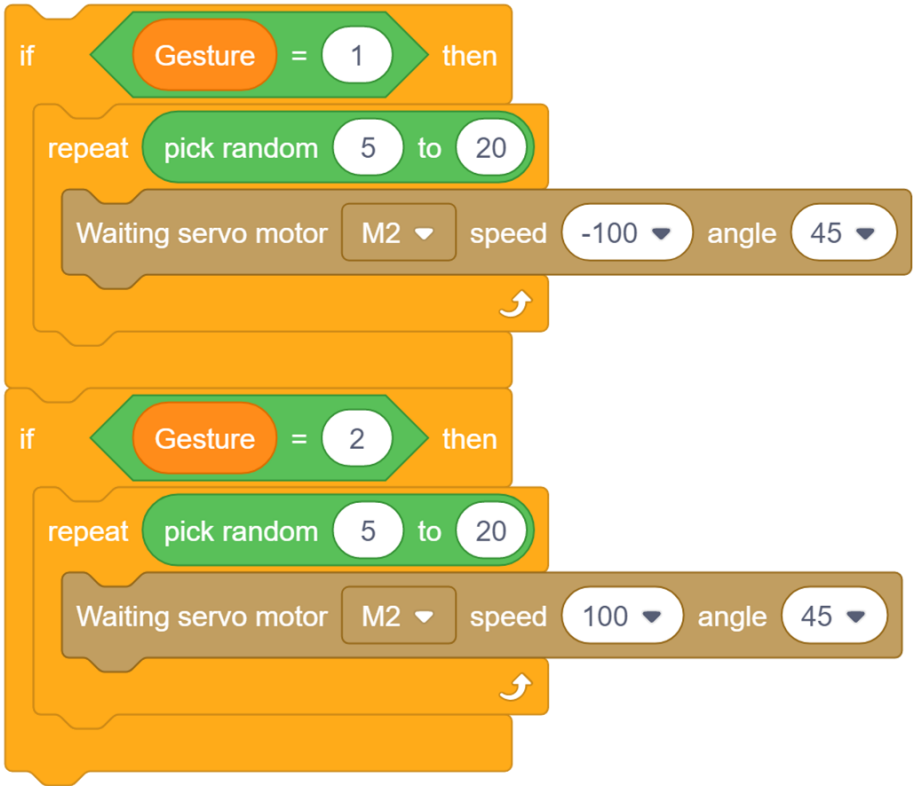
Store the information from the gesture sensor in a variable.



Judge Gestures

Give priority to judging whether there is a gesture, and display the corresponding prompt information when there is no gesture.

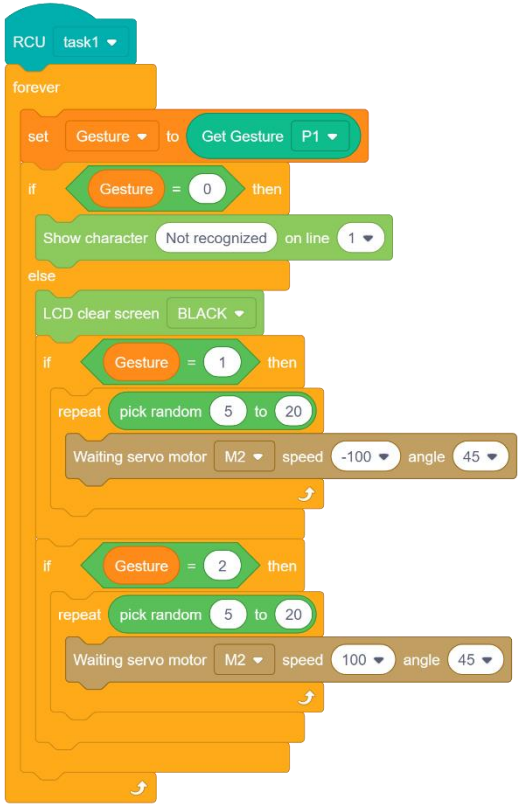
Practice | Programming



Judging gesture

Different gestures control the rotation in different directions. When the left wave is recognized, turn clockwise; when the right wave is recognized, turn counterclockwise.

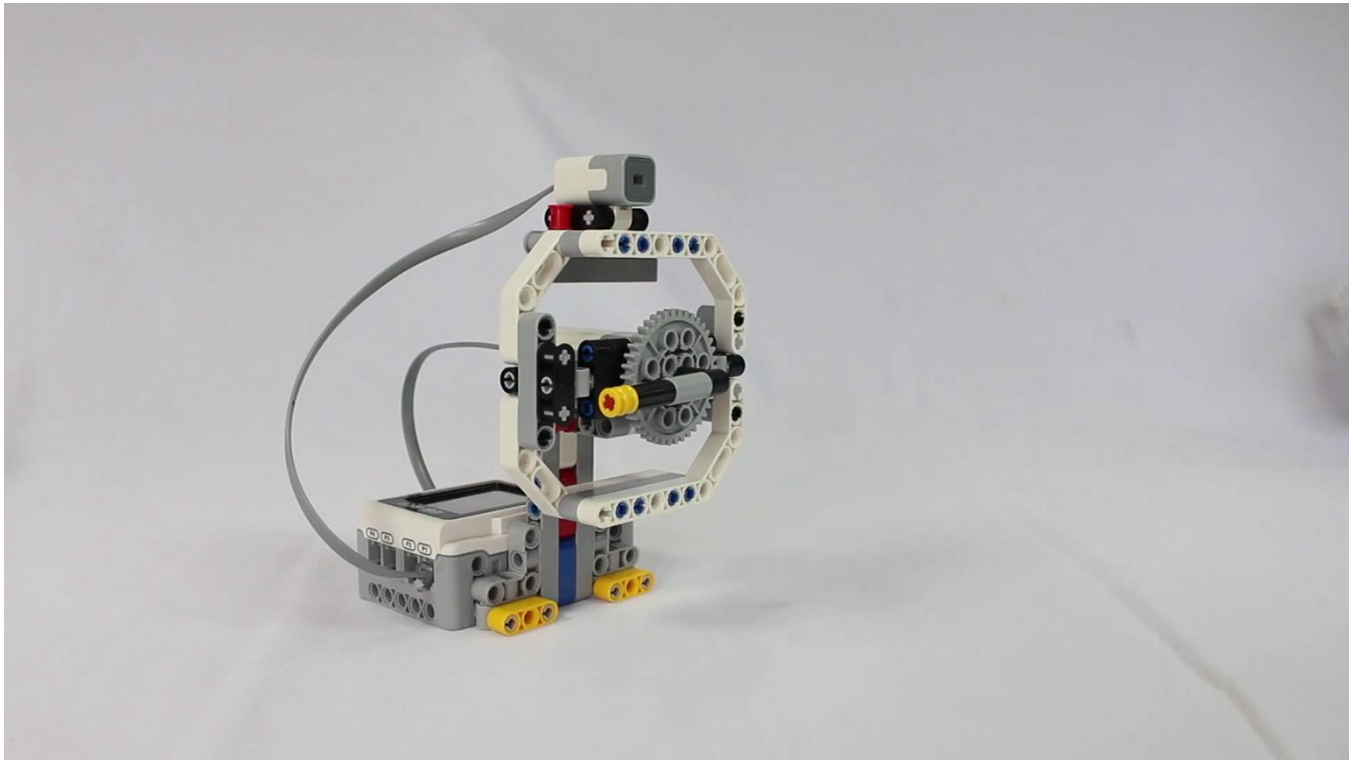
Practice | Programming

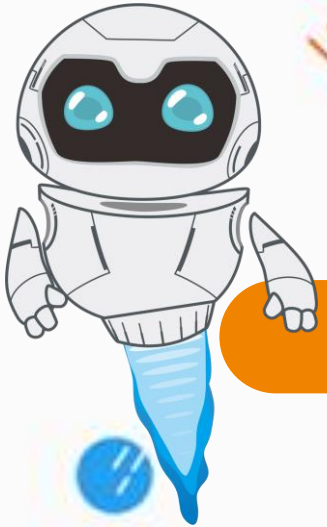


Integrate programs

Integrate the above programs according to the flowchart, and refresh the information of unrecognized gestures every time a gesture is recognized.

Practice | Programming





Results



Program Optimization

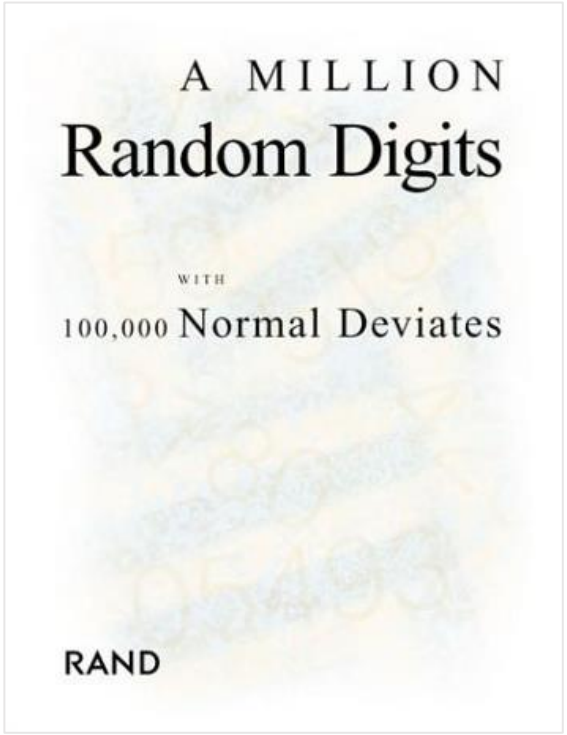
This class implements the function of gesture lottery, for different gestures, rotate clockwise or counterclockwise randomly.

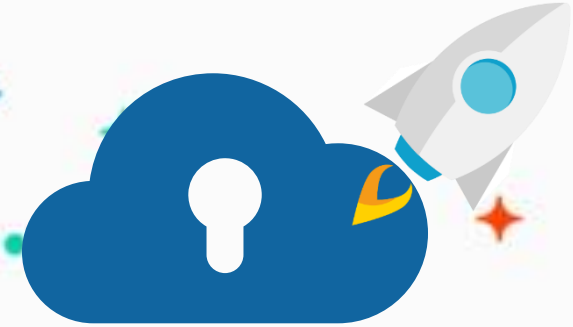
Next, modify the program to include additional gestures that distinguish between long and short turns.

Requirement: Add other gestures to make longer or shorter rotations.

Further Reading

A fair lottery is essentially the use of random numbers. In the mid-1940s, the modern world needed more random numbers than dice could satisfy. RAND Corporation invented a machine that can generate a large number of random numbers through a random pulse generator. They aggregated the numbers generated by the operation of this machine and published it in the book "A Million Random Digits with 100,000 Normal Deviates". This seems ridiculous now, but it was a breakthrough at the time. This is the first time that humans have generated such a large number of high-quality random numbers, and it is open to the public. The book was in print by RAND until 2001 and is still available online.





edu.zmrobo.com

Thanks!

LECTURER: