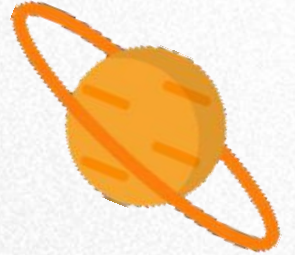


Roboblog



Qoopers series course

Section 15

《Finger-guessing Expert B》

Curriculum objectives

Knowledge and skill

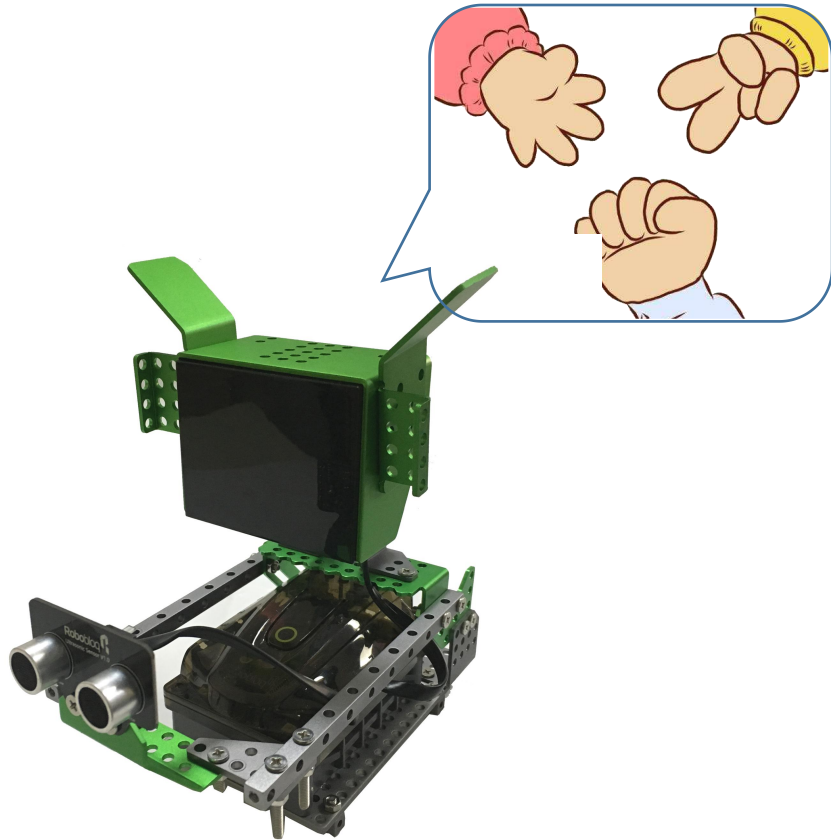
1. Learn the use of random number and variable ;
2. Complete program of Finger-guessing expert with programming knowledge;

Process and methods

1. Exercise students' ability of analysing and solving problem in the programming process;

Emotional attitude and values

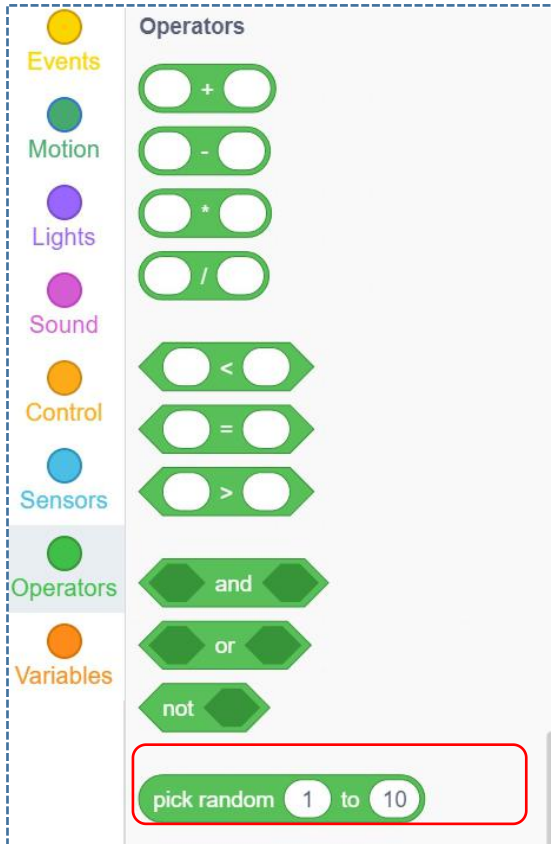
1. Train students to observe things, and know its essence by appearance through the way of understanding life randomness.



We have built the Finger-guessing expert in practice eventually, and it has LED matrix screen and ultrasonic sensor, so how does it achieve finger-guessing?

There is a phenomenon. about figures that called random number in our life, which means, for example, when we toss coin or throw the dice, the positive or negative of coin and number of dice appeared randomly, and the percentage of every condition is same.





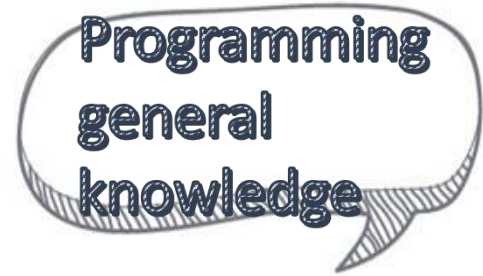
The image shows the Scratch Operators palette. It is organized into several categories on the left: Events (yellow), Motion (green), Lights (purple), Sound (pink), Control (orange), Sensors (blue), Operators (green), and Variables (orange). The Operators section contains several blocks: four basic arithmetic operators (+, -, *, /), three comparison operators (<, =, >), and three logical operators (and, or, not). At the bottom of the Operators section, a 'pick random' block is highlighted with a red rectangle. This block is set to pick a random number between 1 and 10.

We can achieve randomness of stone, scissors, and paper by using random number icon in operators of programming.

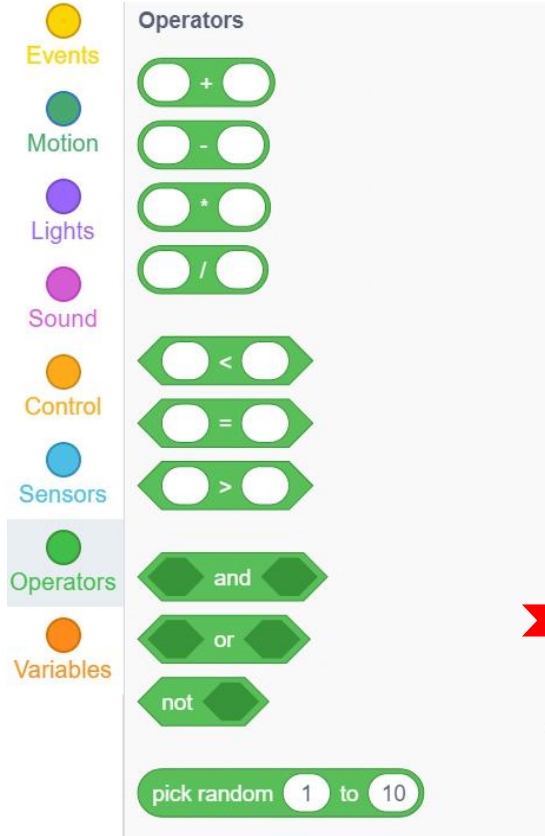
That icon can set randomness of different numbers by yourself, we set 1-3 because finger-guessing only have three conditions.



When we throw the dice, every time number is changeable, so if we use a changeable number, we must conserve it in program process.

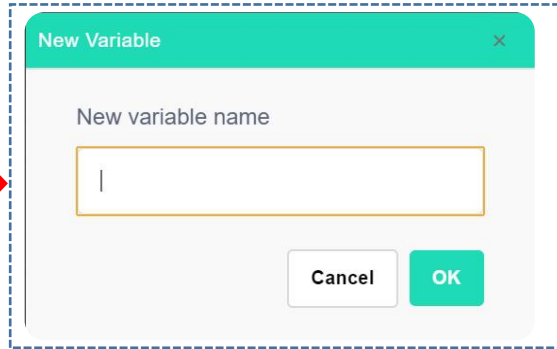


Know variable:
Variable is a constant storage space that have name. Using storage space through variable name, which is the only one in a program. Variable is a temporary storage space of data in program.



The image shows the Scratch Operators palette. On the left, there are colored circles representing different categories: Events (yellow), Motion (green), Lights (purple), Sound (pink), Control (orange), Sensors (blue), Operators (green), and Variables (orange). The Operators category is selected, showing various mathematical and logical operators: addition (+), subtraction (-), multiplication (*), division (/), less than (<), equals (=), greater than (>), and logical operators (and, or, not). At the bottom, there is a 'pick random' block with '1' and '10' in circles.

Create variable:
Click "make a variable" in variable module, and set variable name, for example, "sj".

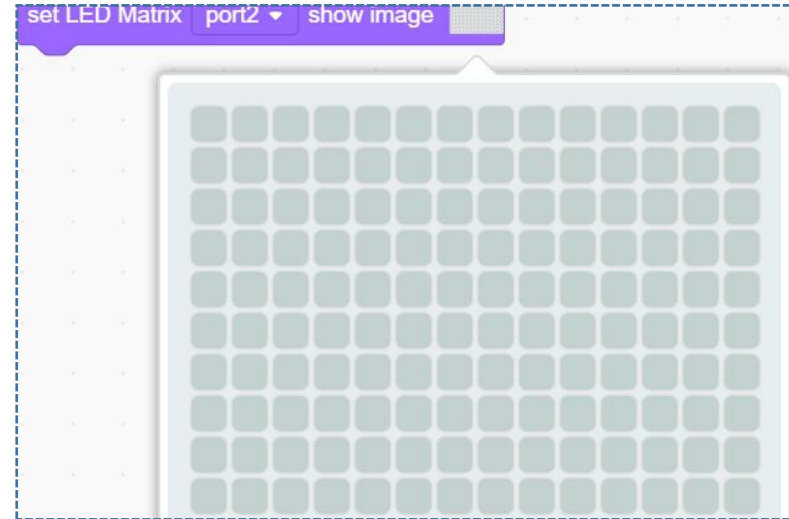


The image shows a 'New Variable' dialog box. It has a title bar with 'New Variable' and a close button (X). Below the title bar, there is a text input field labeled 'New variable name' with a cursor inside. At the bottom, there are two buttons: 'Cancel' and 'OK'.



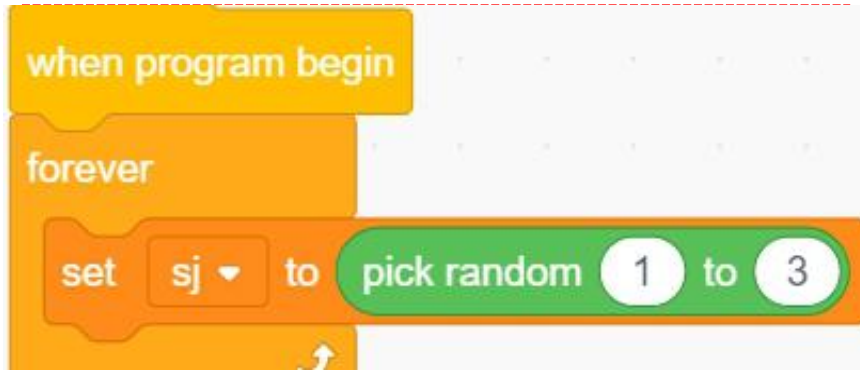
The image shows the Scratch Variables palette. It has a title bar with 'Variables' and a plus sign icon. Below the title bar, there is a 'Make a Variable' button. Underneath, there is a list of variables with a checkmark and a variable name in a circle. The variable 'sj' is checked. Below the list, there are two variable blocks: 'set sj to 0' and 'change sj by 1'.

Setting LED matrix screen image by mouse to click different image in light module.

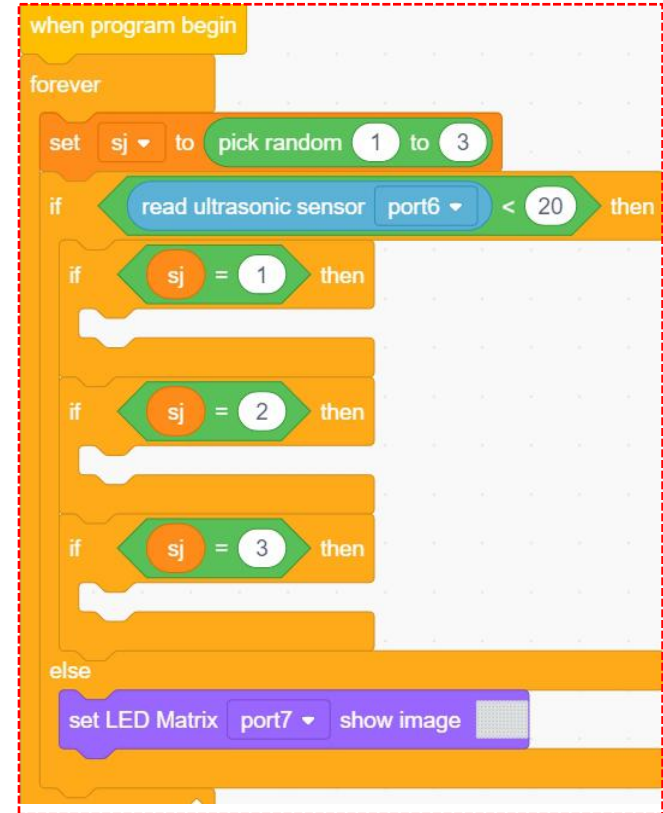


Programming

1. Setting variable "sj" are random number among 1-3 ;
2. Set the first condition that ultrasonic sensor detect the other person to show hand shape, after that set three random conditions.

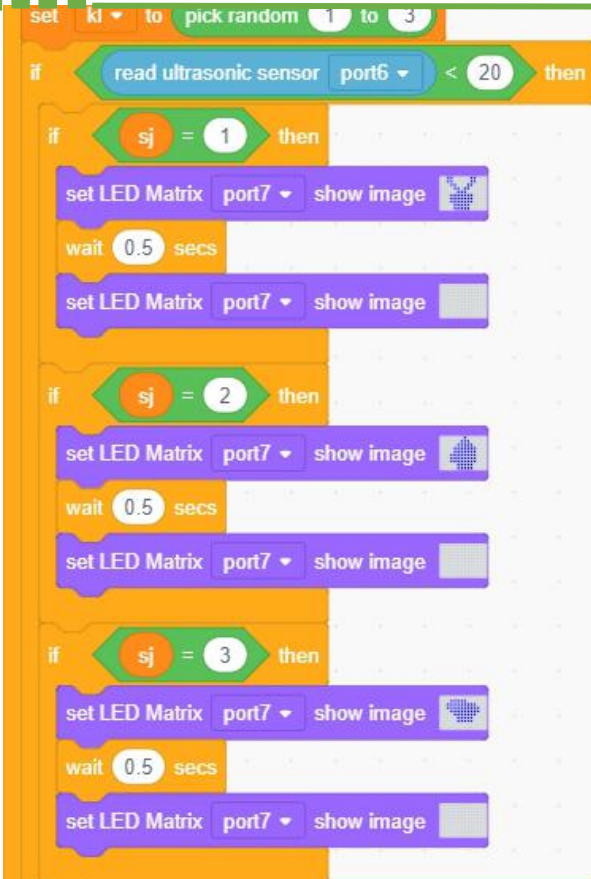


```
when program begin
forever
  set sj to pick random 1 to 3
```



```
when program begin
forever
  set sj to pick random 1 to 3
  if read ultrasonic sensor port6 < 20 then
    if sj = 1 then
    if sj = 2 then
    if sj = 3 then
  else
    set LED Matrix port7 show image
```

Programming



```
set k1 to pick random 1 to 3
if read ultrasonic sensor port6 < 20 then
  if sj = 1 then
    set LED Matrix port7 show image [stone image]
    wait 0.5 secs
    set LED Matrix port7 show image [no image]
  if sj = 2 then
    set LED Matrix port7 show image [scissors image]
    wait 0.5 secs
    set LED Matrix port7 show image [no image]
  if sj = 3 then
    set LED Matrix port7 show image [paper image]
    wait 0.5 secs
    set LED Matrix port7 show image [no image]
```

3. Set random numbers 1, 2, 3 correspond stone, scissors, paper, and added time length that showed, after show return origin condition; no image was showed in LED matrix screen if ultrasonic sensor didn't detect the other person's hand.

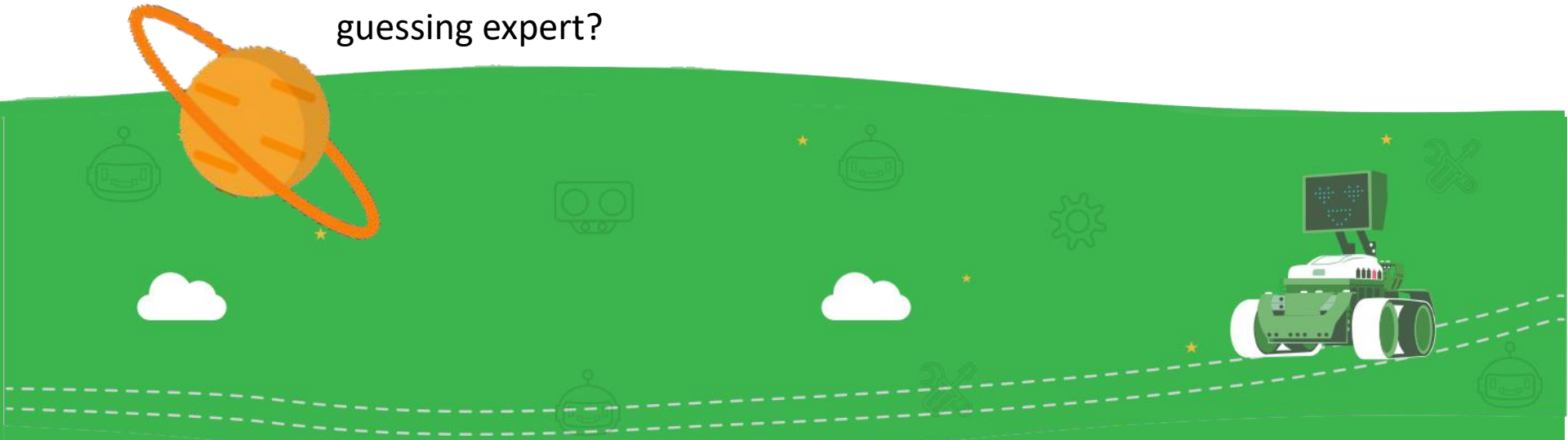
Does Finger-guessing expert show image accurately after write program successfully?
And battle with it , are you win it?



Summary and rethink

1. What phenomenon have randomness in our life?

2. What is your winning rate when battle with Finger-guessing expert? Think about that what ideas can improve winning rate of Finger-guessing expert?



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