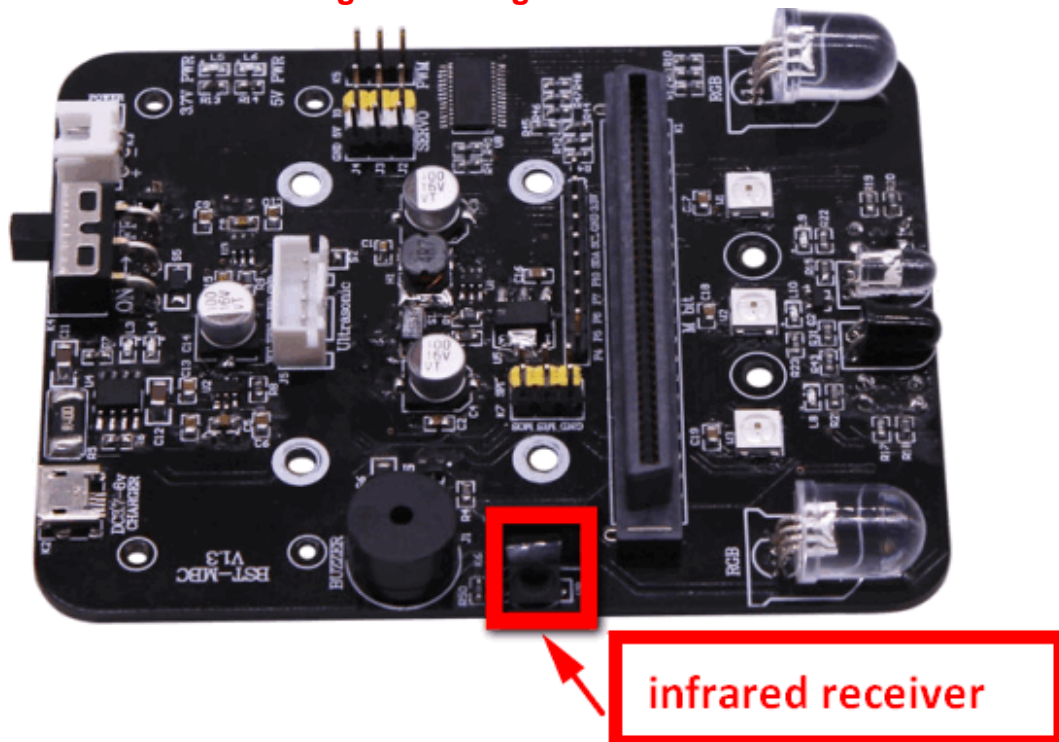


Lesson1 of Building:bit Tower crane--“Infrared remote control”

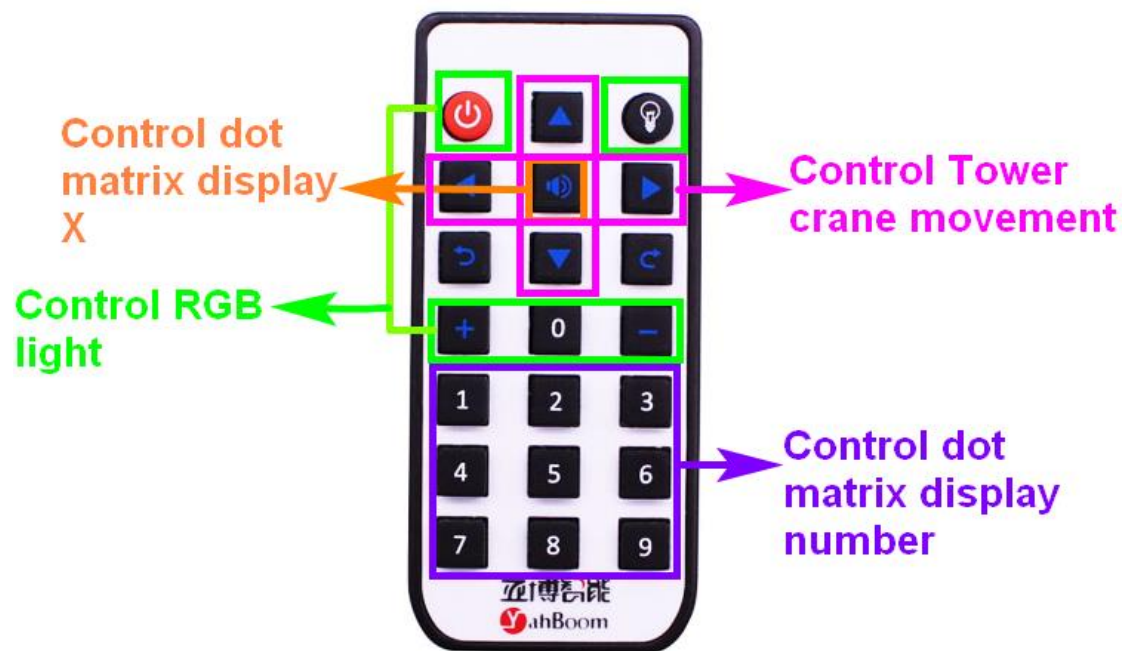


Note:

1. When performing infrared remote control, the remote controller should face the infrared receiver on the expansion board.
2. There is a plastic piece on the bottom of the infrared remote controller that needs to be taken down for normal use.
3. The infrared light emitted by the infrared remote controller and the infrared receiver is invisible to the human eye. It can be seen under the camera without filtering infrared light.



1.Experimental phenomena



2.Preparation before class

We needs to be ready:

Building Block Tower crane *1

micro:bit handle *1

USB data cable *1

2-1.Two programming methods:

Online programming:

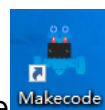
First,we need to connect the micro:bit to the computer by USB data cable, the computer will pop up a USB flash drive.Then, click on the URL in the USB flash drive: <http://microbit.org/> to enter the edit process interface, click to

【Extensions】 , and copy the package URL:

https://github.com/lzty634158/yahboom_mbit_en and

https://github.com/lzty634158/YB_IR to the input field, and you can use the building blocks of the Yahboom software package.

Offilne programming:

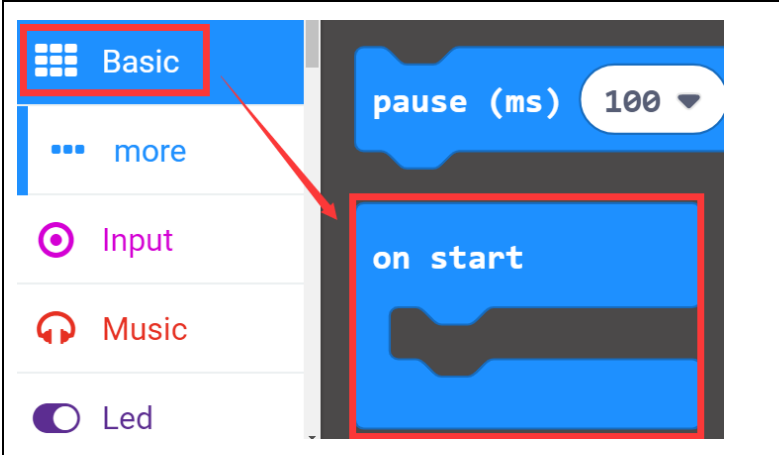
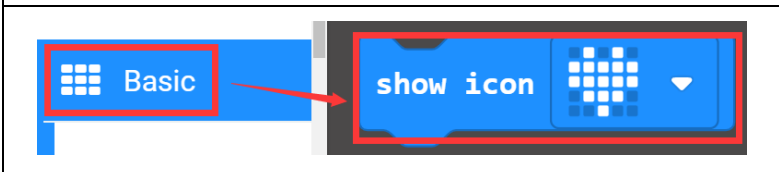
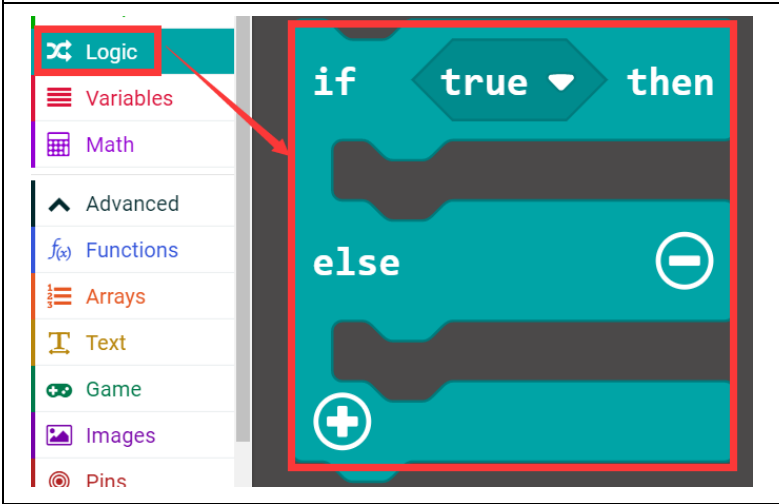
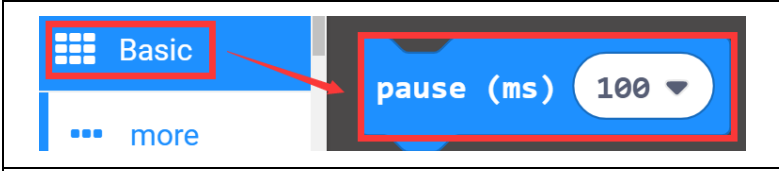
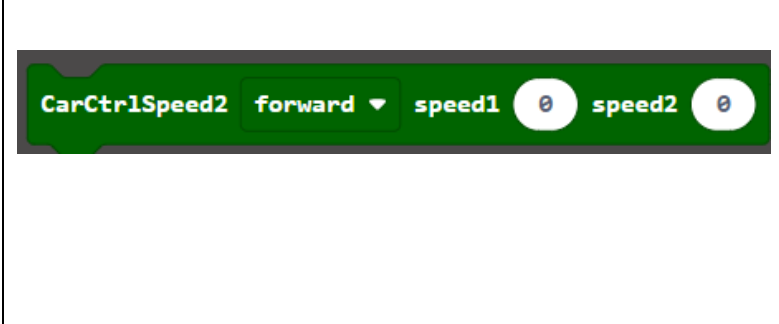


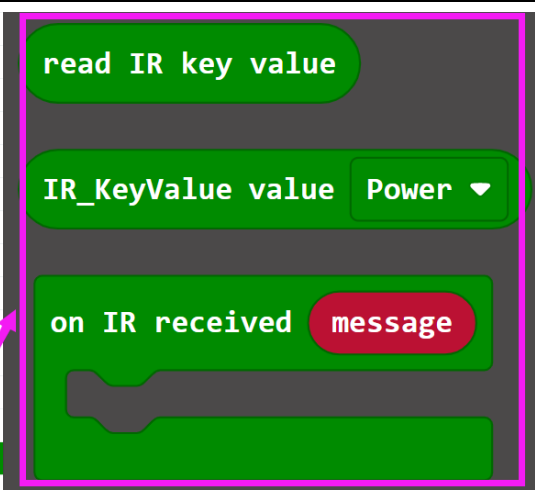
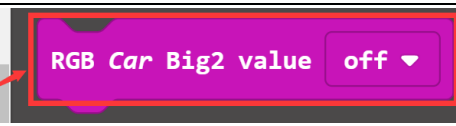

Open the offline programming software [Makecode](#) , click to 【Extension】 and copy the package URL: https://github.com/lzty634158/yahboom_mbit_en and https://github.com/lzty634158/YB_IR to the input field, and you can use the building blocks of the Yahboom software package.

For detailed programming, please read the documentation before class 【1. Preparation before class】 ---- 【Introduction of programming method】 . We use micro:bit official website for online programming in here.

3.Studying blocks

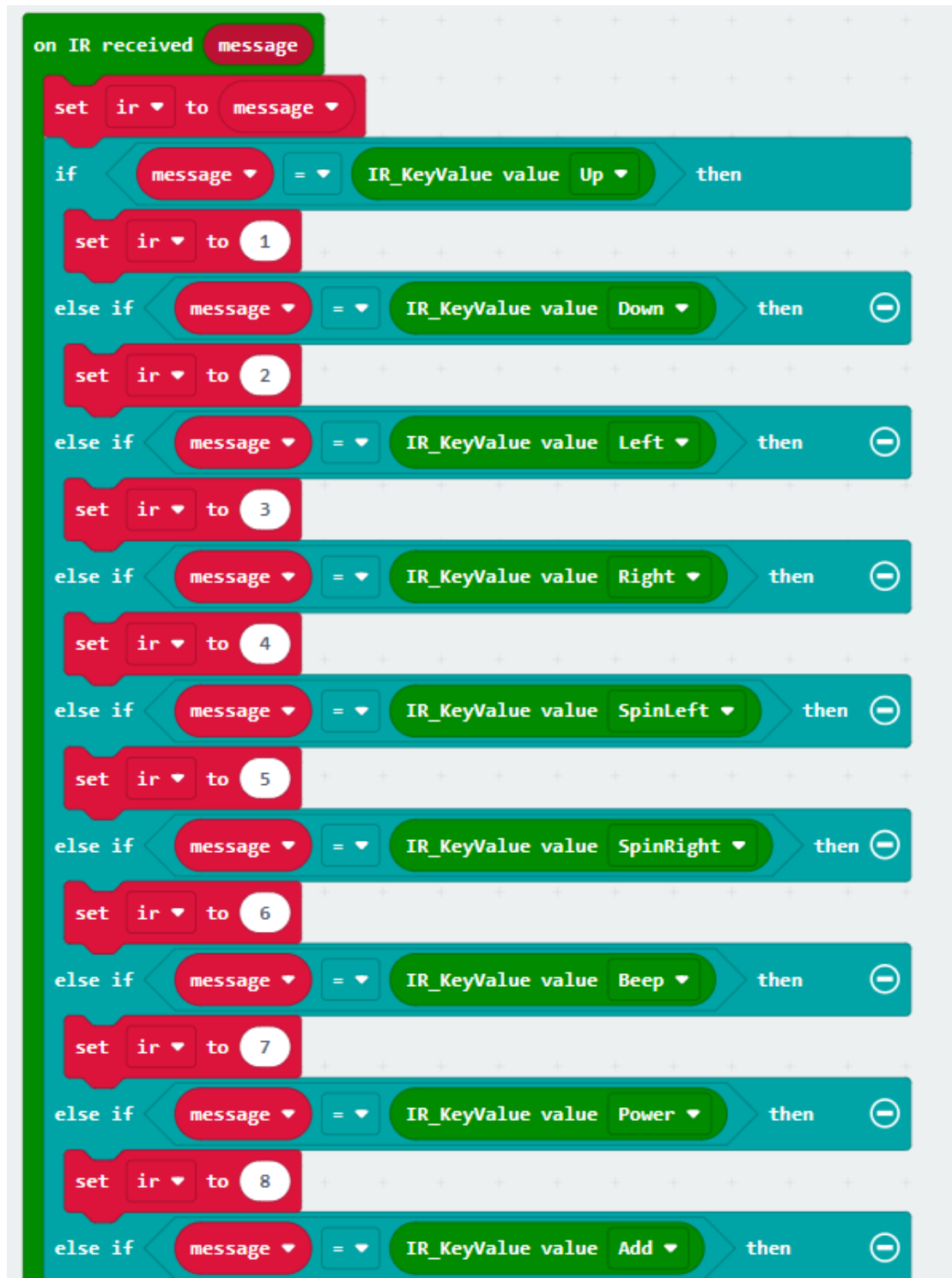
Blocks	Instruction
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	<p>Executed at boot time, the code is only executed once.</p>
	<p>Display image on the lattice of micro:bit.</p>
	<p>If true then execute. If it is false, it will not be executed.</p>
	<p>The program pauses for 100 milliseconds and the time can be modified by yourself.</p>
	<p>The car control forward represents the motor rotates in the positive direction and the car control back represents and the motor rotates in the opposite direction.</p>

<ul style="list-style-type: none"> Led Radio Loops Logic Variables Math Mbit_Display Mbit_Sensor Mbit_Input Mbit_Music Mbit_Motor Mbit_Robot Mbit_IR_V1.5 Mbit_IR_V2 		<p>When the power button on the remote controller is pressed, the code inside will be executed, and the button can be customized.</p> <p>Set the infrared remote control receiving pin. In this experiment, the receiving pin is P8, so you must select P8, otherwise you will not receive the signal.</p>
<ul style="list-style-type: none"> Mbit_Motor Mbit_Robot 		<p>Select the color of the lights.</p>
<ul style="list-style-type: none"> Music 		<p>Can play different tones.</p>

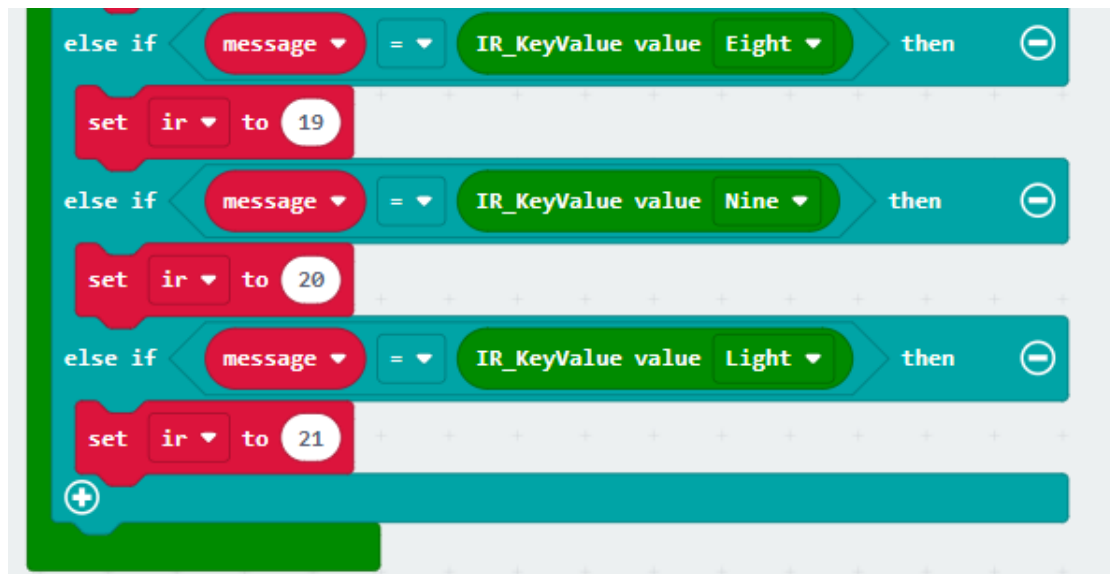
4.Programming

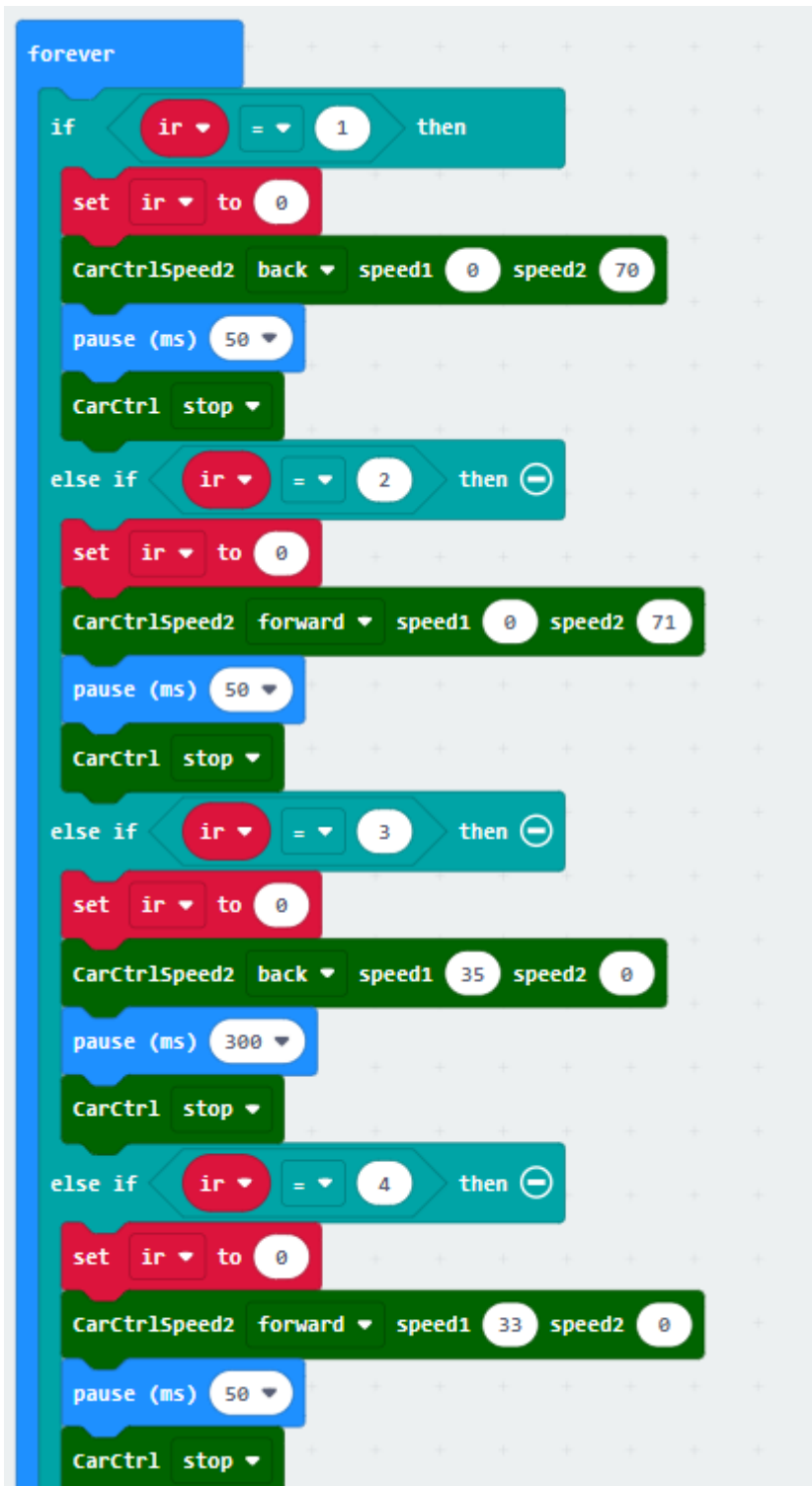
Next, we started to write the program for the infrared remote control of the building block Tower crane, as shown below:

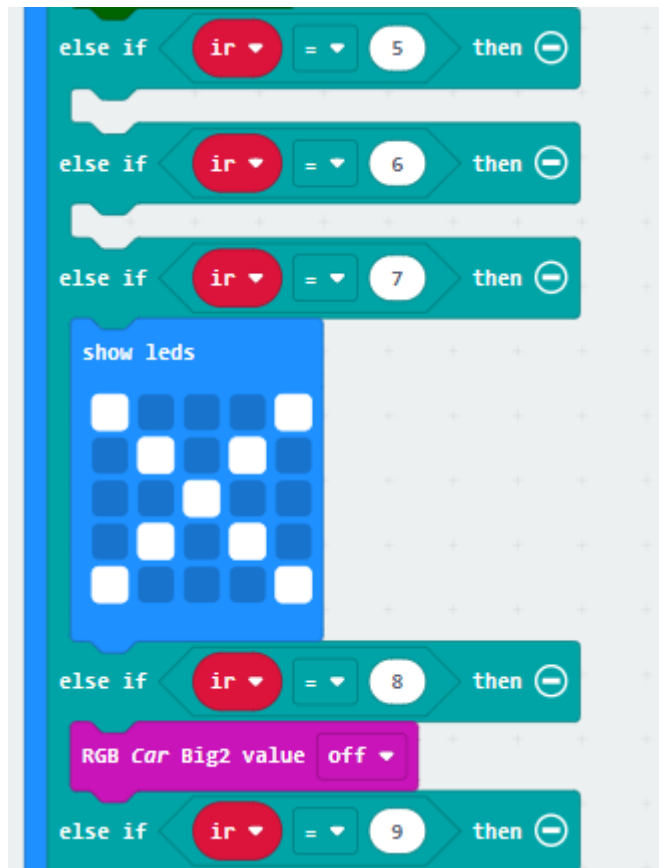


The image shows a Scratch script designed to map specific IR key values to a sequence of IR numbers (9 through 18). The script is composed of a series of 'set' and 'else if' blocks. Each 'set' block is followed by an 'else if' block that checks if the 'message' variable is equal to a specific 'IR_KeyValue' value. If the condition is met, the script proceeds to the next 'set' block. The 'IR_KeyValue' values are Zero, Minus, One, Two, Three, Four, Five, Six, and Seven, which correspond to the IR numbers 9 through 18 respectively. The script is visually organized with red 'set' blocks and teal 'else if' blocks, each containing a dropdown menu for the 'message' variable and a dropdown menu for the 'IR_KeyValue' value. The 'set' blocks are labeled with the IR number they are setting (9 to 18). The 'else if' blocks are labeled with the 'IR_KeyValue' value they are checking for. The script is set against a light gray background with a green vertical bar on the left side.

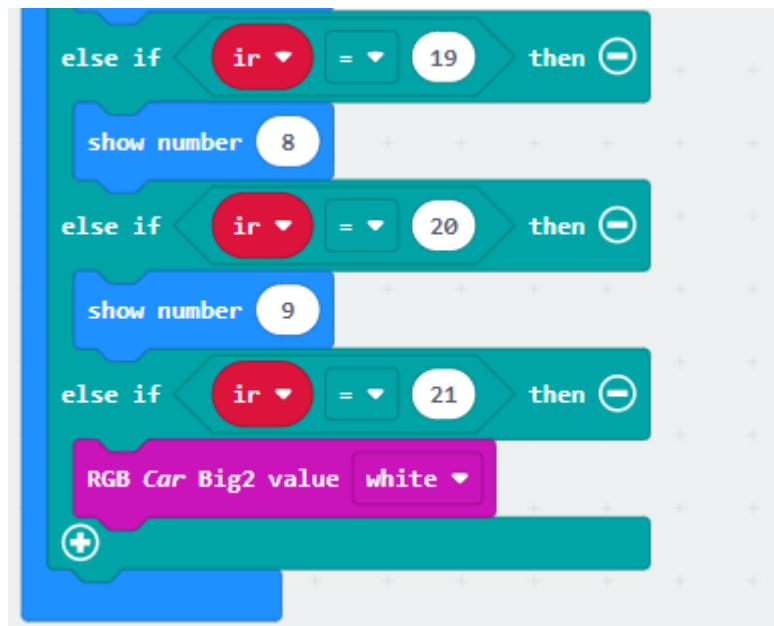
```
set ir to 9
else if message = IR_KeyValue value Zero then
set ir to 10
else if message = IR_KeyValue value Minus then
set ir to 11
else if message = IR_KeyValue value One then
set ir to 12
else if message = IR_KeyValue value Two then
set ir to 13
else if message = IR_KeyValue value Three then
set ir to 14
else if message = IR_KeyValue value Four then
set ir to 15
else if message = IR_KeyValue value Five then
set ir to 16
else if message = IR_KeyValue value Six then
set ir to 17
else if message = IR_KeyValue value Seven then
set ir to 18
```











The above is the program for this Tower crane. After writing, we need to download it to the micro:bit board.