Micro:bit Circular RGB LED Expansion Board SKU: ROB0150

Introduction

This board can be a cool clock, a timer, a Lucky Turntable Game, a wearable ornament, and an interactive colored pendant. With a micro:bit main board, this 24 RGB LEDs circular expansion board changes to an exquisite creator's piece. You can turn it into a tomato timer via the onboard buzzer, and turn it into a colorful music spectrometer through the onboard microphone; There are two external ports P0, P1 in reserve, so you can get more ways to play by connecting a large number of boson and gravity sensors. With different paper-cuts and acrylics, you can put on a variety of new clothes for the expansion board. For example, put on red Chinese knot for it in Chinese New Year, put on the cartoon face for it at Children's Day, put on the snow or Christmas tree for it at Christmas.....

Features

- Support USB interface power supply and direct use of power-bank power supply or USB computer power supply.
- Support PH2.0 interface power supply and the battery box or lithium battery power supply are both OK.
- 24 RGB single-line lights, 16 million colors free mixing
- Makecode graphical programming
- Onboard microphone and buzzer
- Leaded out P0 and P1 interfaces, and distribute with the connection line, support the boson expansion modules.
- Ultra-thin volume,more suitable for wearable and strap applications.

Specification

- Supply Voltage:3.5~5V
- WS2812 Single-line RGB LEDs x 24
- Onboard buzzer x 1
- Onboard microphone x 1
- Number of interfaces: IO expansion board(P0,P1)x2, PH2.0 Power Interface x1, USB power Interface x1

Function Description

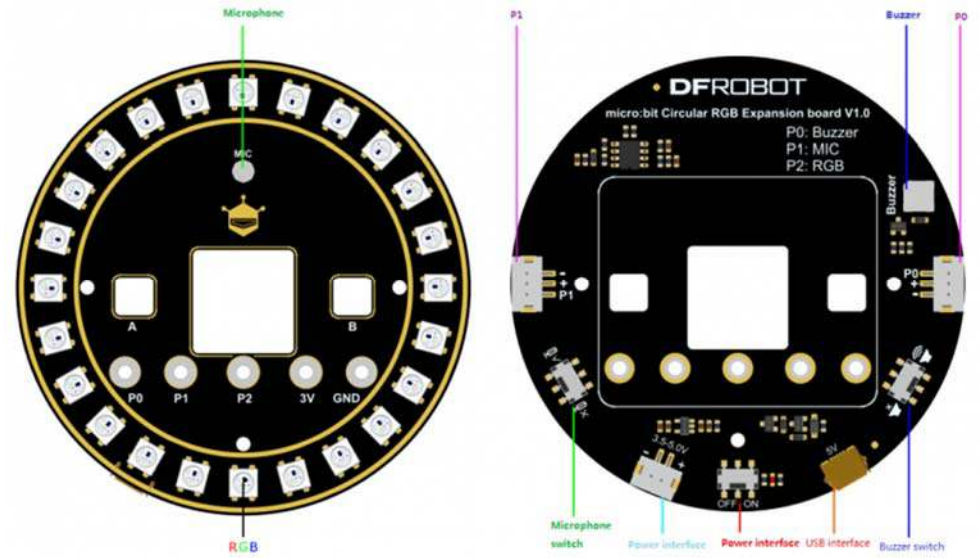
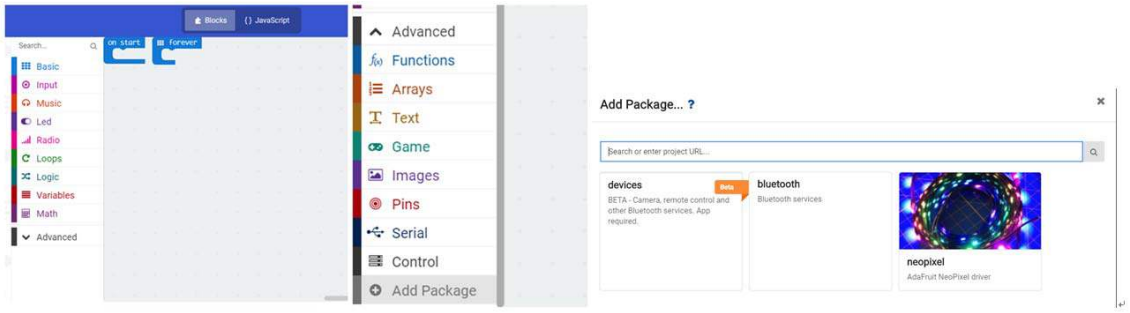


Fig1:ROB0150 Function Description

Note: After uploading the micro: bit program you need to connect the USB cable to the expansion board for power, You can also use 3.5-5.0 V power supply to power from the expansion board battery!

Makecode Tutorial Examples

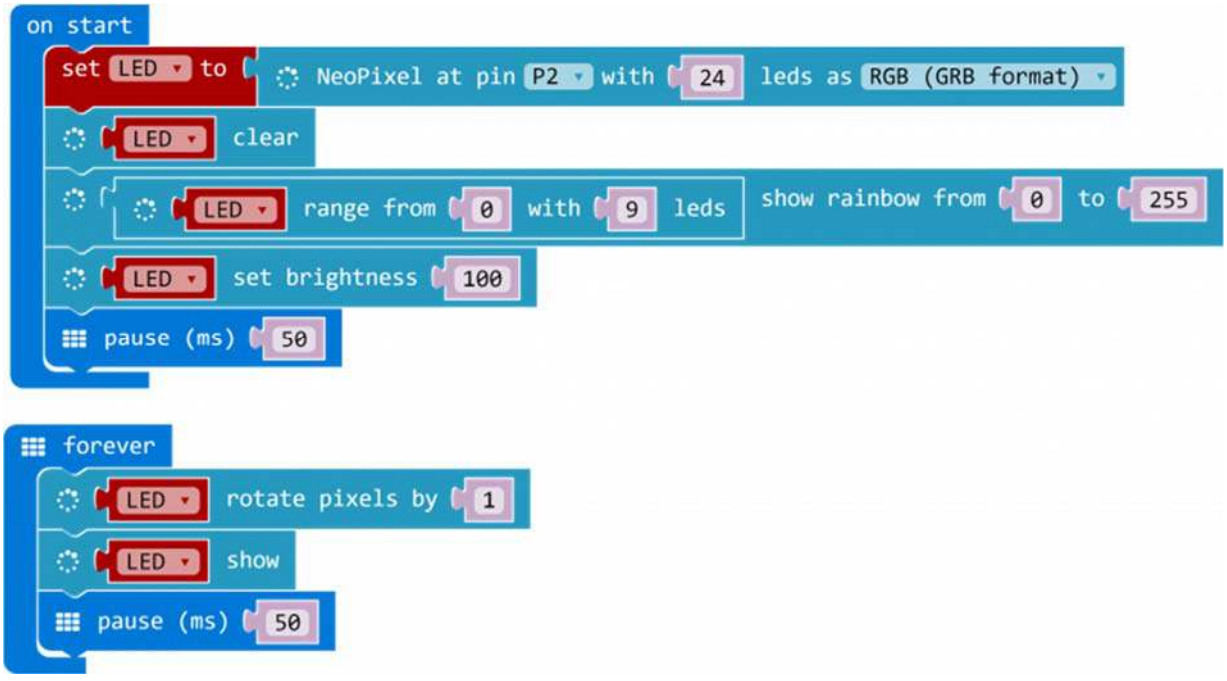
- Click and enter the graphic programming: https://makecode.microbit.org/
- Preparation work, add the **neopixel** software package, in other words, loading the lamp ring library; the steps are as follows.



Add the software package

Rotated Circular Light

Click and enter the graphic programming:The Graphic Programming of Rotated Circular Light
Effect: The 9 RGB LEDs display 9 colors (gradients), and then on the lamp ring the nine RGB LEDs display the 9 colors in a continuous loop just like a waterfall light.



Rotated Circular Light

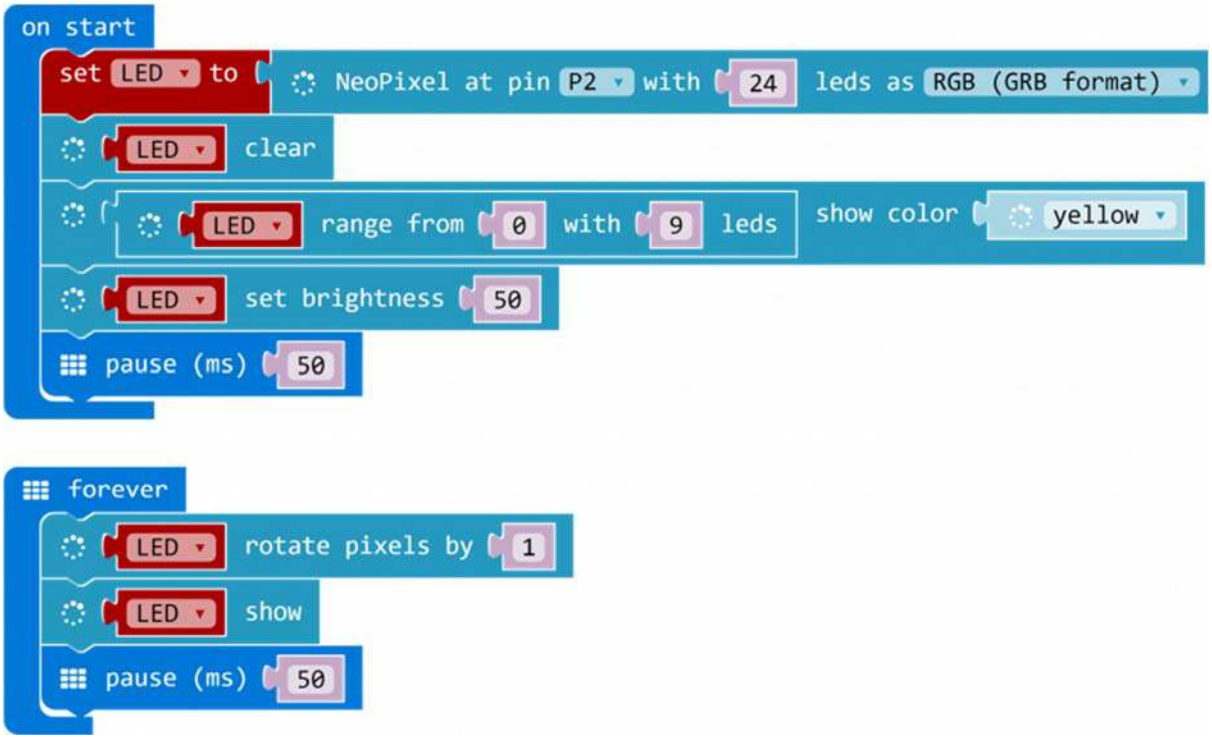
Light up 9 LEDs from the No. 0 LED

Light up 9 LEDs from the No. 0 LED and the color range 0~255.

Set the brightness of the LED to 100

Set the rotation speed

Modify to solid color rotation effect
Click and enter the graphic programming：Yellow Rotating Circular Light

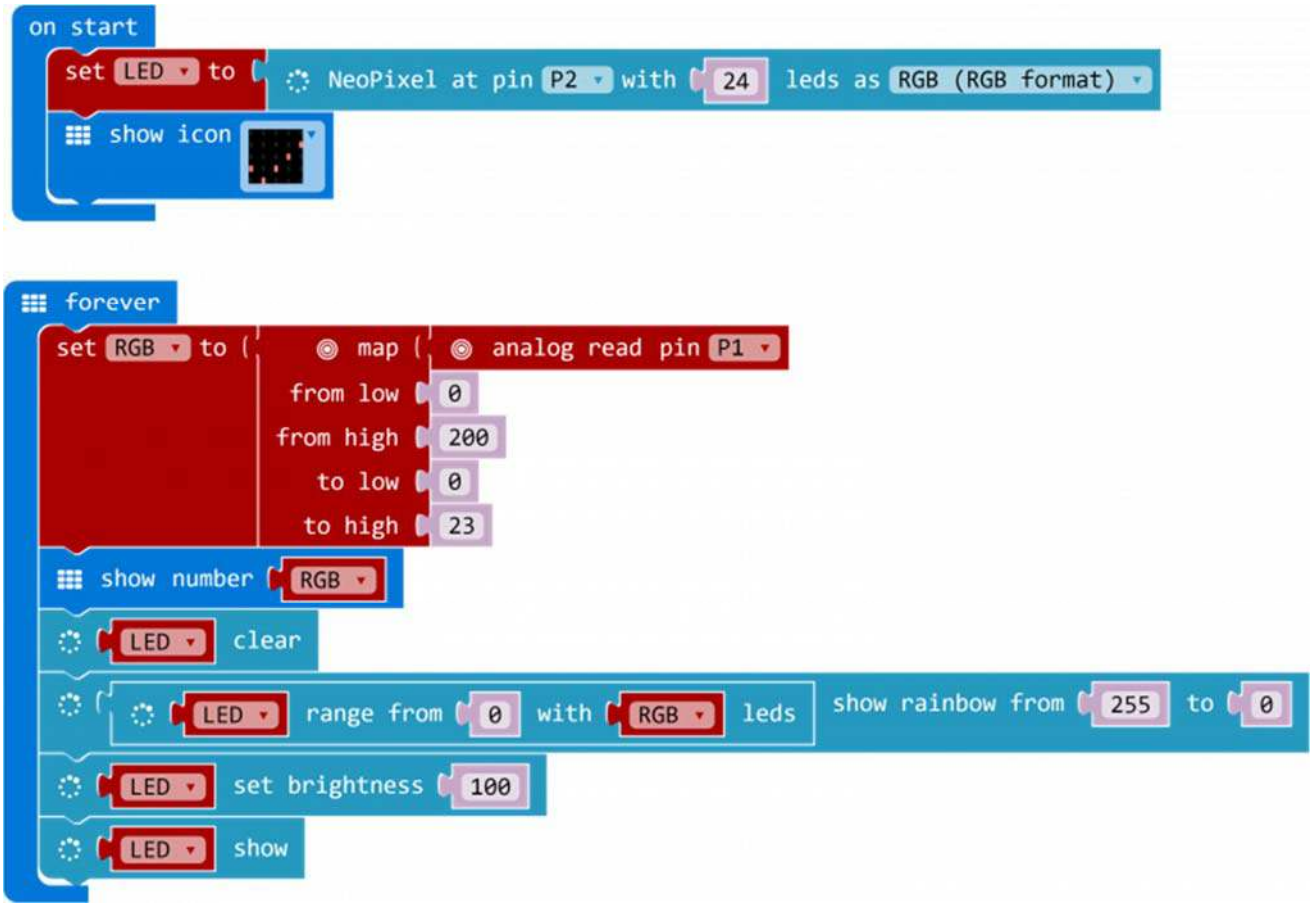


solid color

Modify the color behind the show color to get other solid color rotation effects.

Sound Control Circular Light

Click and enter the graphic programming: The Graphical Programming of Voice Control Circular Light
Effect: Light up 24 RGB LEDs in sequence according to the size of the detected sound, forming a gradual pulsating light ring.

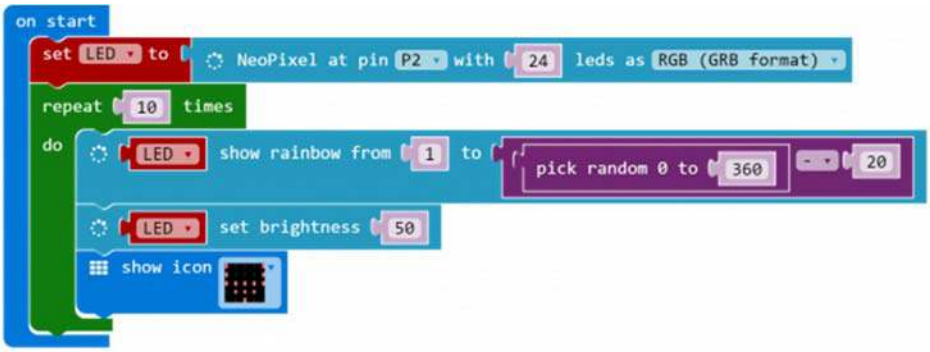


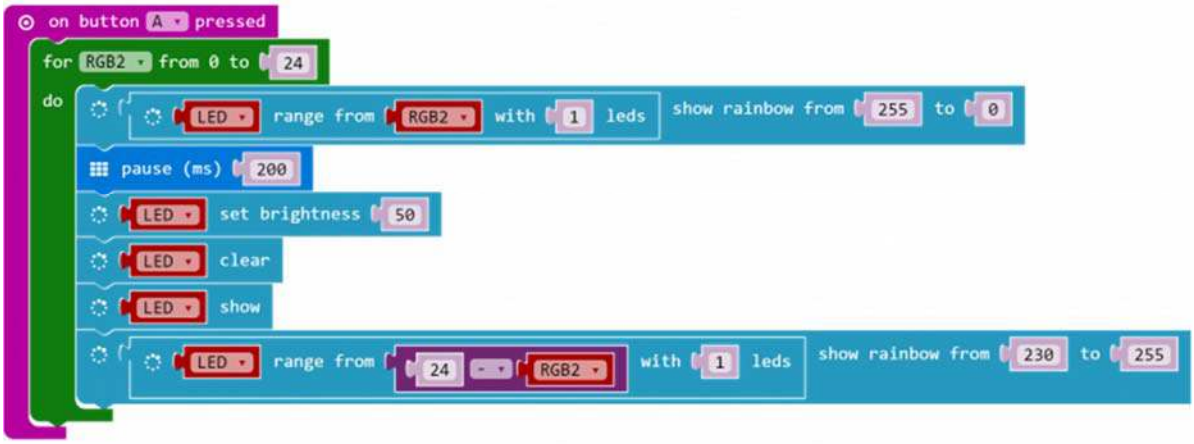
Sound Control Circular Light

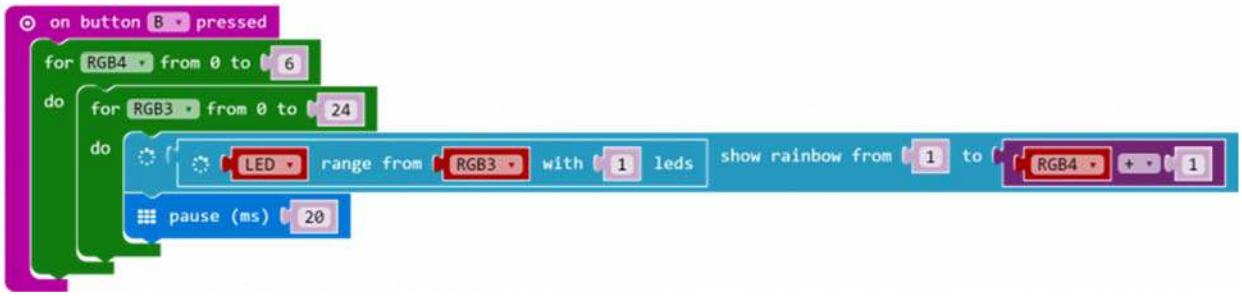
By modifying the "Map" to change the relationship between sound intensity and the number of alight leds. 0~300 represents the range of sound; 0~23 represents 24 RGB LEDs.

Control the Circular Light via Key A, B

Click and enter the graphic programming: Control the Annular Light via Key A, B
Effect: Turn on the power, then 24 RGB LEDs display some colors randomly in the beginning. When key A is pressed, executing the waterfall light mode once; When B is pressed, the circular light refreshes the color in every 20ms, and there are 7 colors at all.







Control the Circular Light by Key A, B

RGB LEDs display color randomly when power on.

Display colors randomly

When key A is pressed, two-way waterfall light is started, that is, forward, reverse simultaneously.

Forward Waterfall Light

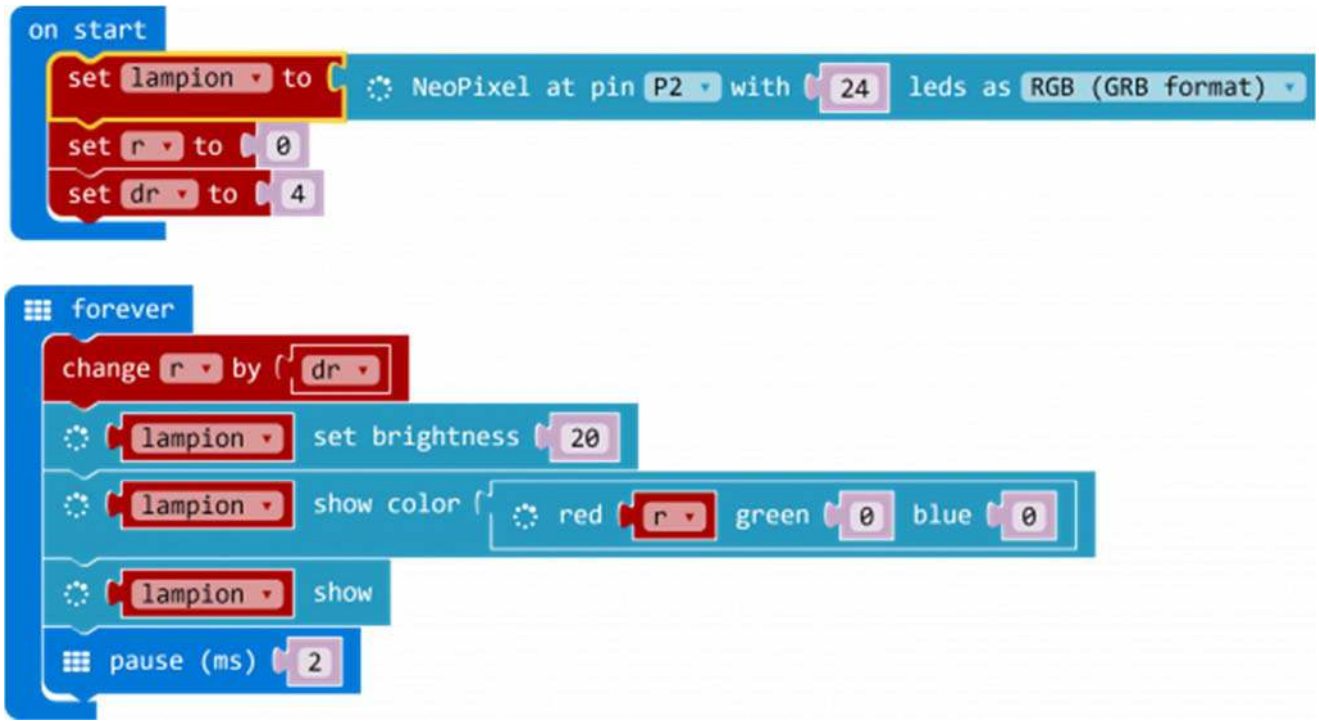
Reverse Waterfall Light

When key B is pressed, the circular light is refreshed in every 20 ms.

color+1, show 7 colors at all

Breathing Light

Click and enter the graphic programming:Breathing Light
Effect: 24 RGB LEDs light up red at the same time, the brightness changes from weak to strong in loop, like breathing.

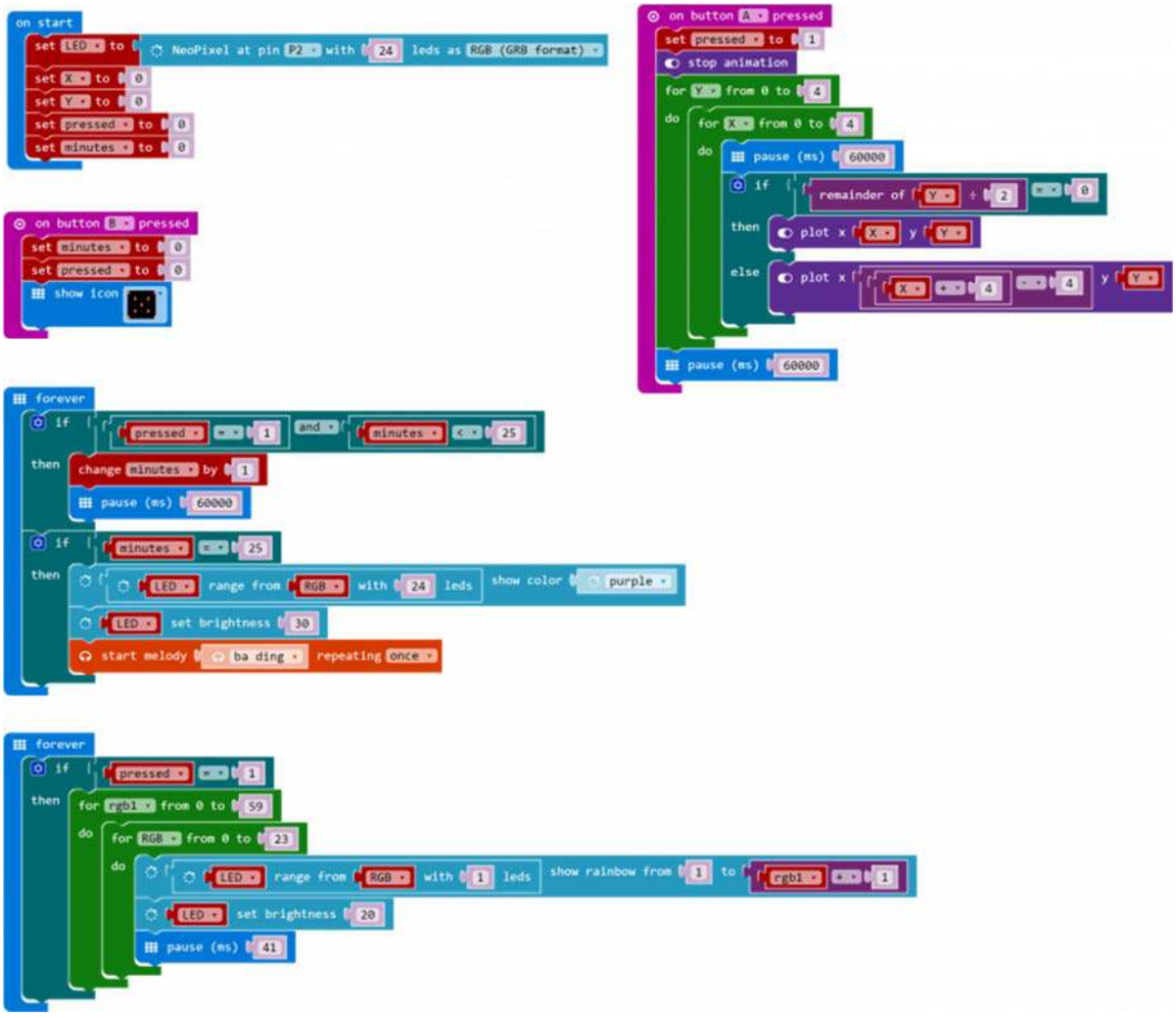


Breathing Light

Tomato Timer

The Pomodoro technique is a simple time management method. Essentially, it is to set a 25-minute work period and do only one thing in this period. So this is a 25 mins timer.

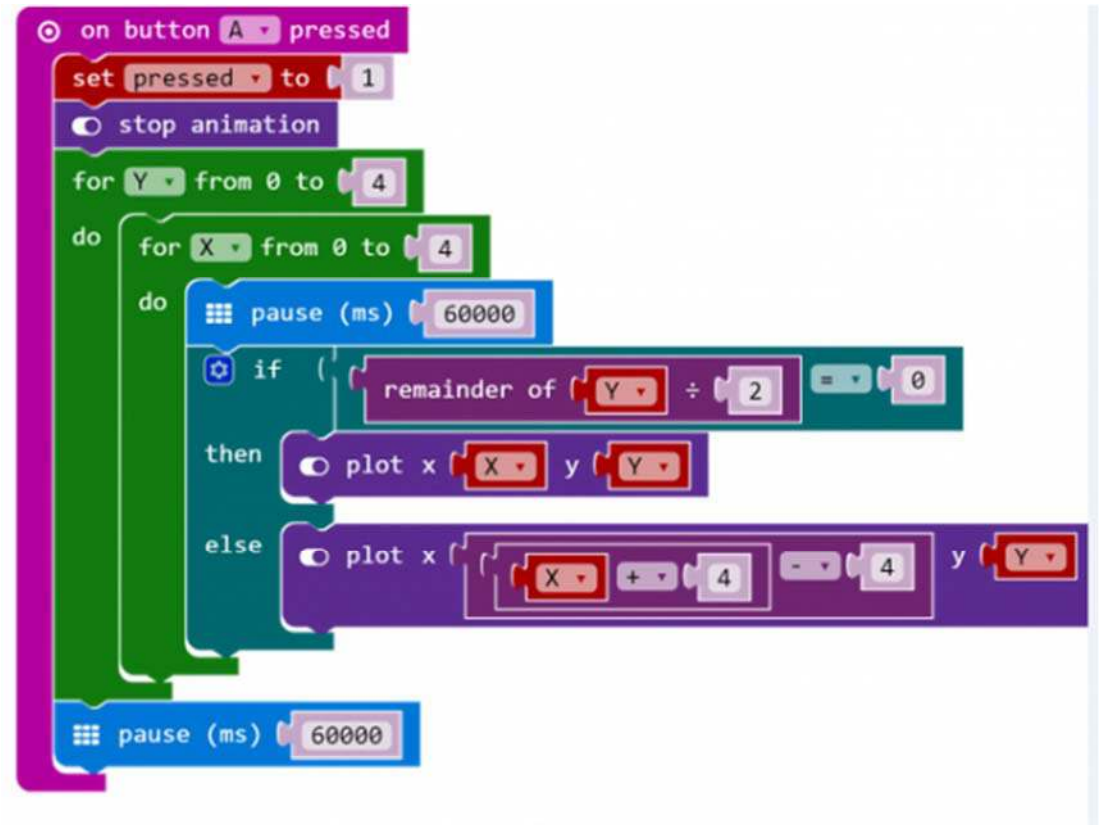
Click and enter the graphic programming:Tomato Timer
Effect: Press key A to start the program and light a LED on the main board in every minute. When all LEDs are on, the buzzer beeps; When key B is pressed, stops the buzzer and stops timing. The circular light refreshes the color in every second.



Tomato Timer

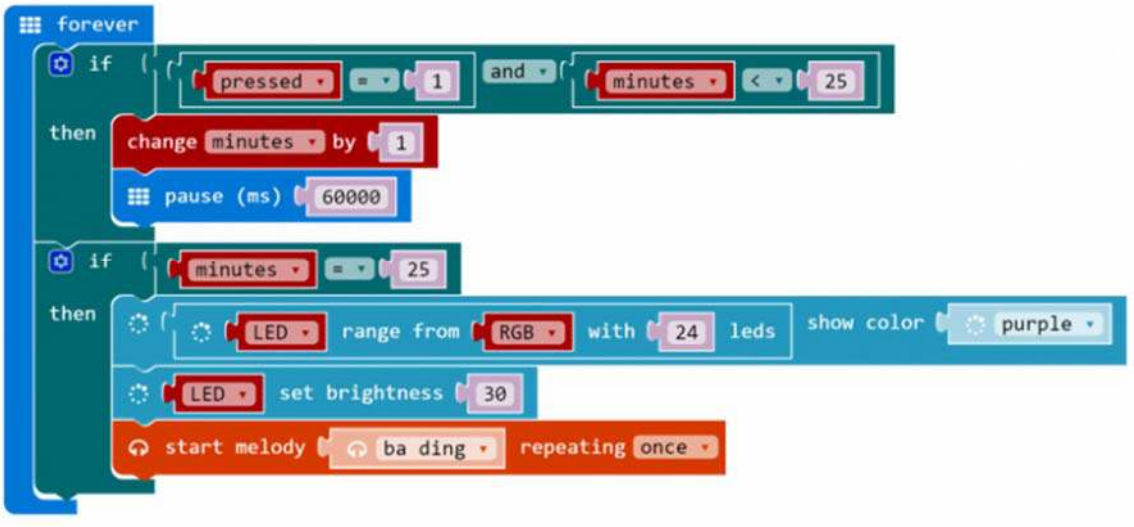
Execution Process:
Firstly, define some variables. Such as "X", "Y", "pressed", "minutes".
Where "X" and "Y" are the LED dot matrix coordinates of the micro:bit board.

Turn on the leds



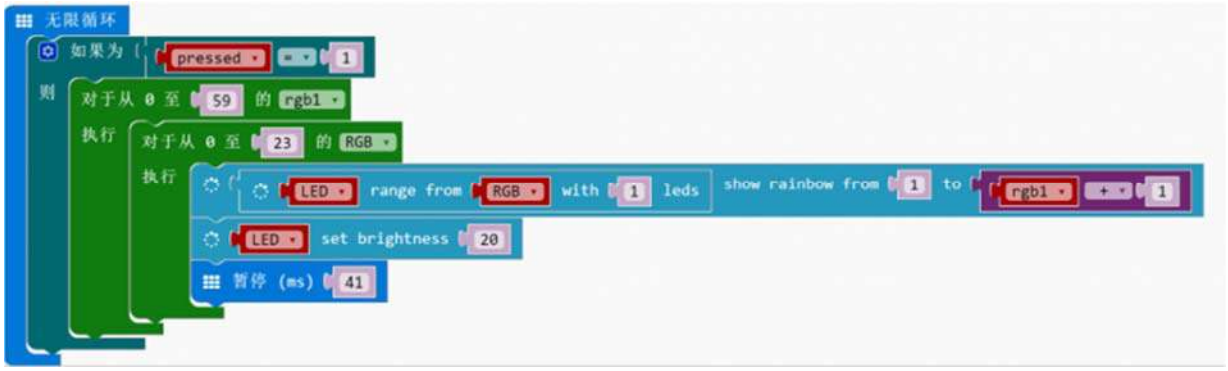
Set Dot Matrix

Set Time
Minutes<25;minutes+1;
When minutes=25, the buzzer rings;



Set Time

Set the effect of circular light
When key A is pressed, start the circular light program; refresh the color in every second.



Set the Effect

Calculation formula for the time interval between each RGB LED: 6000ms (1min) / 24 (24 RGB LEDs) / 60 (repeat 60 times) ≈41ms.