3.Alarm Clock

1. Learning goals

In this lesson, we will learn to use micro:bit and Wrist:bit make a smart alarm clock based on light intensity.

2. Working principle

Micro:bit does not come with light-sensitive sensor. The detection of the external light intensity is carried out through the LED matrix. The LED matrix is used to sense the surrounding light, and repeatedly convert the LED into an input, and sample the voltage decay time.

In this course, we mainly use the building blocks shown in the figure below.

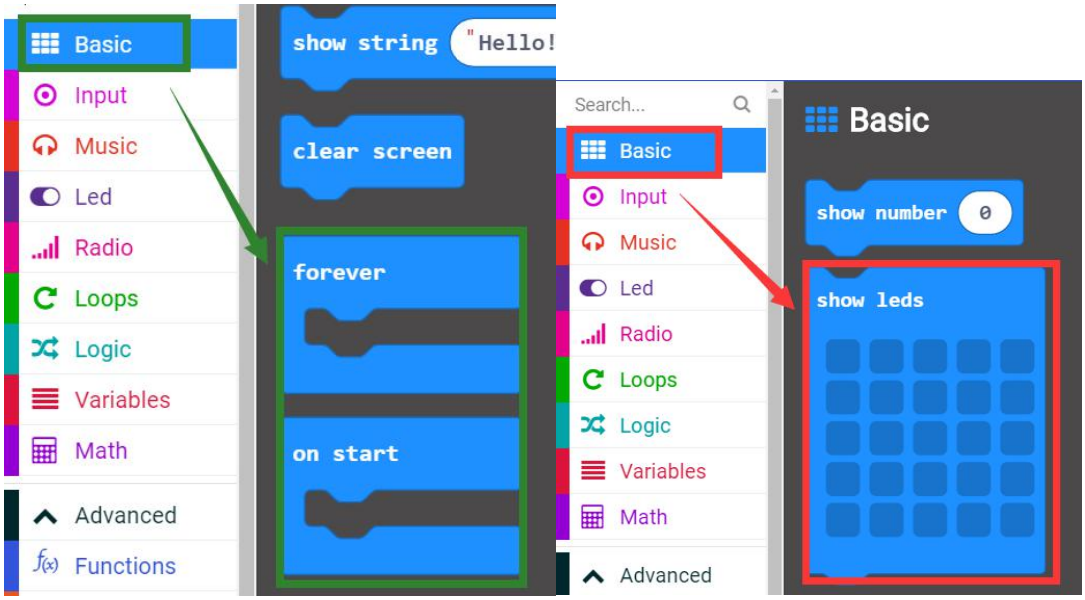
3. Programming method

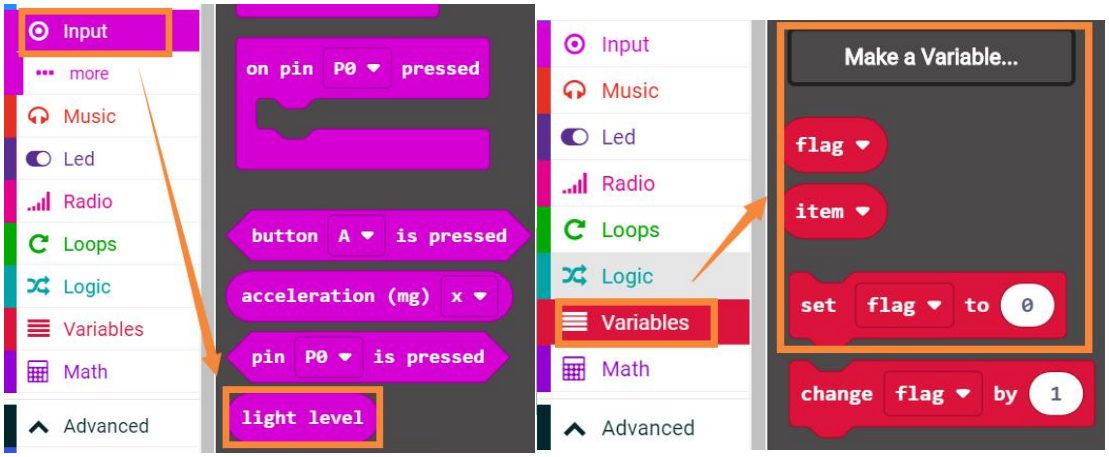
Mode 1 online programming: First, we need to connect the micro:bit to the computer by USB cable. The computer will pop up a USB flash drive and click on the URL in the USB flash drive: http://microbit.org/ to enter the programming interface to program.

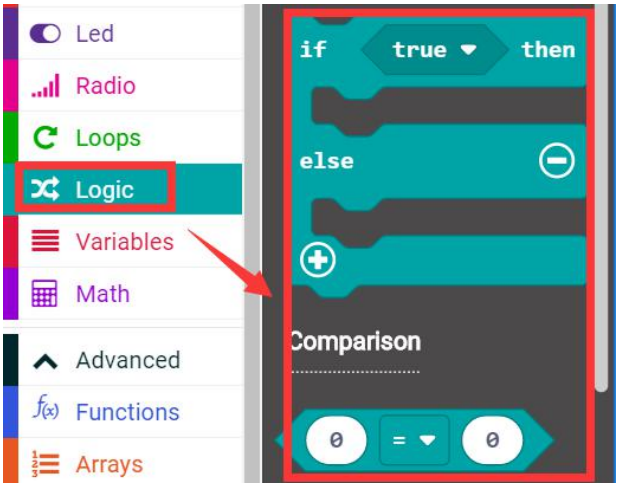
Mode 2 offline programming: We need to open the offline programming software. After the installation is complete, enter the programming interface, click【New Project】, you can program.

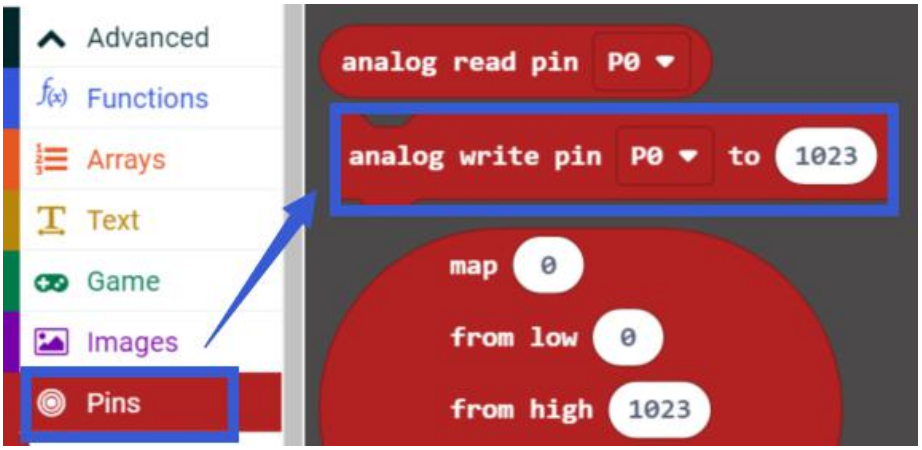
4. Looking for blocks

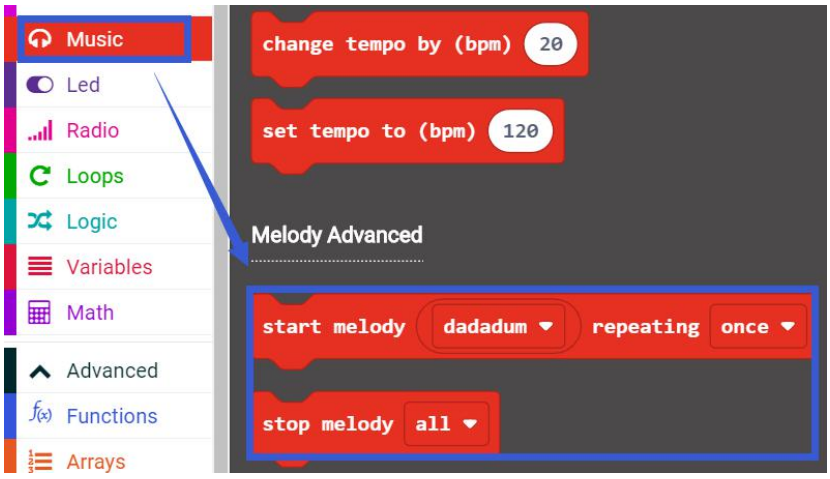
The following is the location of the building blocks required for this programming.




Input
more
Music
Led
Radio
Loops
Logic
Variables
Math
Advanced
on pin P0 pressed
button A is pressed
acceleration (mg) x
pin P0 is pressed
light level
Make a Variable...
flag
item
set flag to 0
change flag by 1

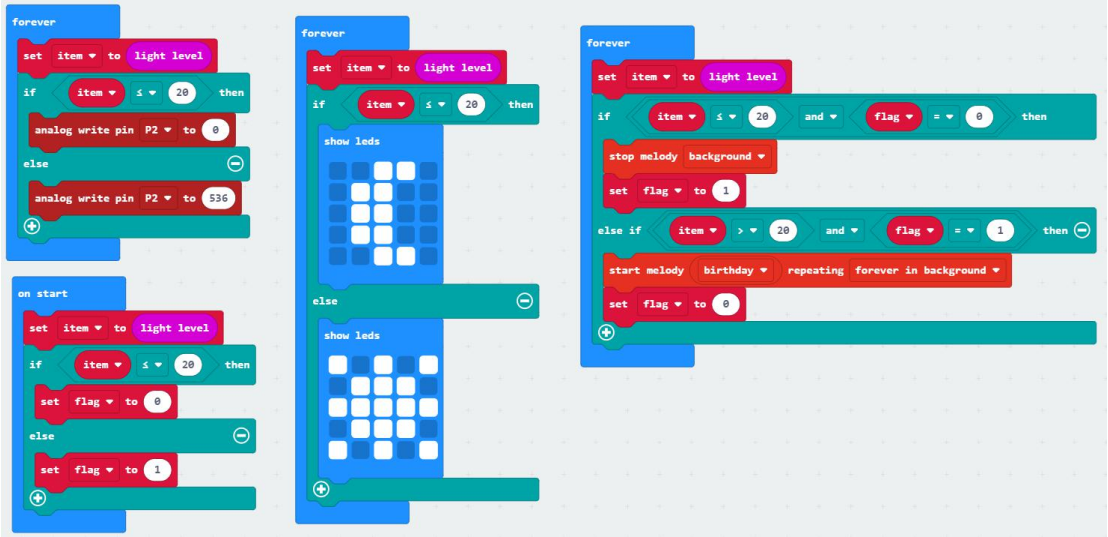

Led
Radio
Loops
Logic
Variables
Math
Advanced
Functions
Arrays
if true then
else
Comparison
0 = 0


Advanced
Functions
Arrays
Text
Game
Images
Pins
analog read pin P0
analog write pin P0 to 1023
map 0
from low 0
from high 1023



5. Combine block

The summary program is shown below.



Due to motor is connected to the P2 pin of the micro:bit on the hardware circuit.
If you need to control the vibration motor, you only need to write the P2 pin digitally to 1 or use P2 to write the analog quantity.
In this course, we use the analog quantity control the speed of the motor.

5. Experimental phenomena

After the program is successfully downloaded.
When the brightness of the environment is relatively large, the micro:bit dot matrix displays the sun pattern, and the birthday song and vibration will be played at the same time.
When the environment is relatively dark, the micro:bit dot matrix will display the moon pattern. At this time, the music is closed and the vibration stops.