## 8.Morning and night

### 1. Learning goals

In this lesson, we will learn to how to make micro:bit display different patterns according to external light.

### 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.

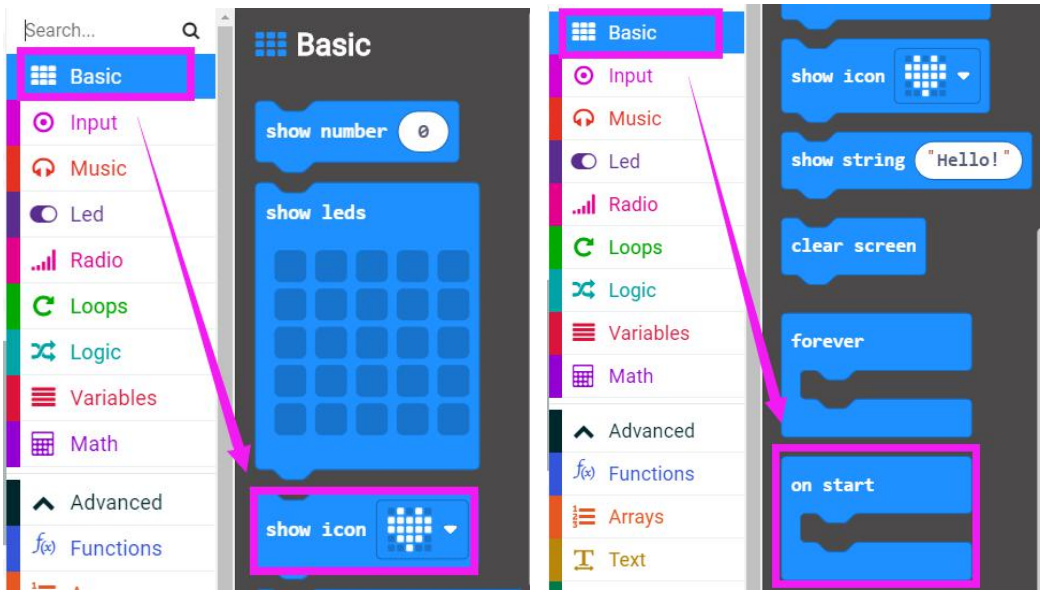

### 3. Programming method

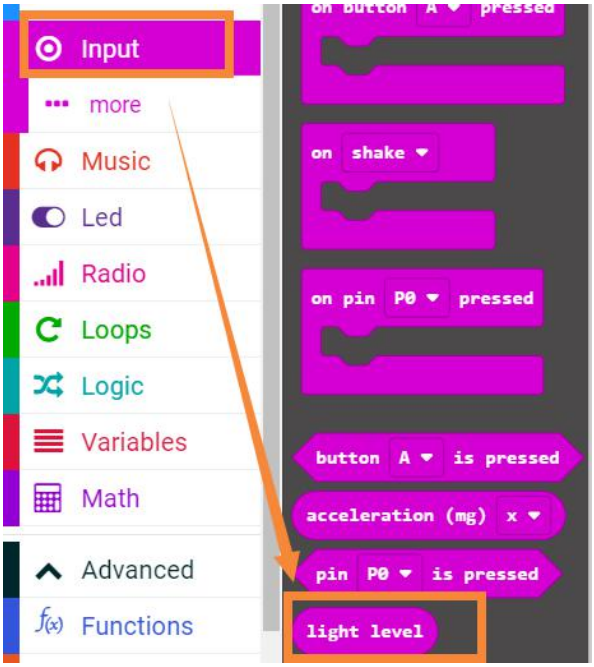
**Mode 1 online programming:** First, we need to connect the micro:bit to the computer by USB cable. The computer will pop up a USB flash drive and click on the URL in the USB flash drive: http://microbit.org/ to enter the programming interface to program.

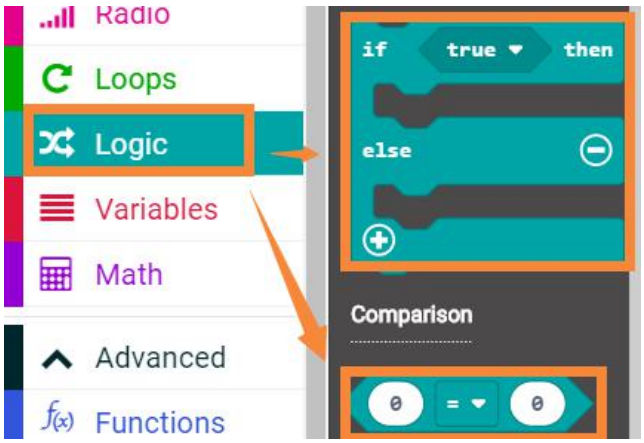
**Mode 2 offline programming:** We need to open the offline programming software. After the installation is complete, enter the programming interface, click【New Project】, you can program.

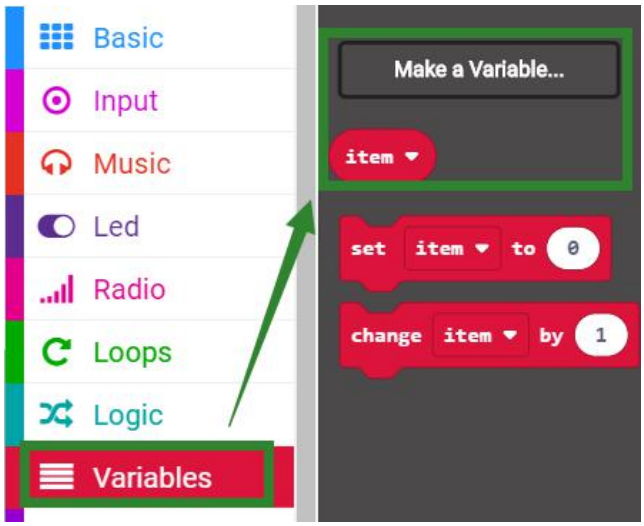
### 4. Looking for blocks

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



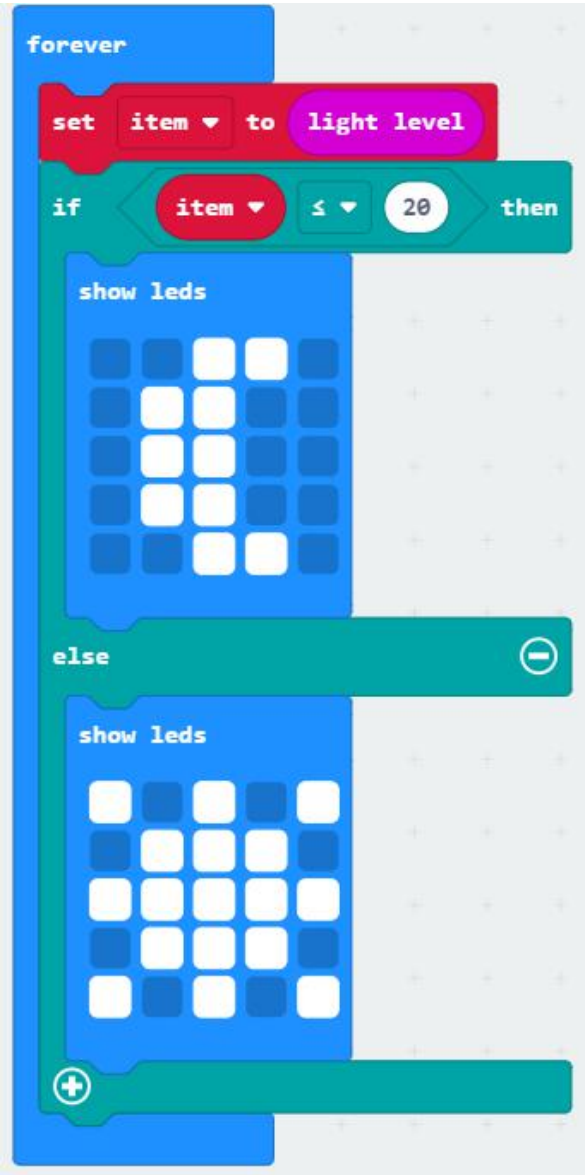

Input
more
Music
Led
Radio
Loops
Logic
Variables
Math
Advanced
Functions
on shake
on pin P0 pressed
button A is pressed
acceleration (mg) x
pin P0 is pressed
light level


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


Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Make a Variable...
item
set item to 0
change item by 1

**5. Combine block**

The summary program is shown below.




**6. Experimental phenomena**

After the program is successfully downloaded.

When the micro:bit board is in a relatively bright environment, a sun pattern will be displayed on the dot matrix, which means to say "Good morning" to everyone.

When the micro:bit board is in a relatively dark environment, a moon pattern will appear on the dot matrix, which means to say "Good night" to everyone.