

Keyestudio

Project 7: Accelerometer

1. Description

The Micro:bit board has a built-in LSM303AGR acceleration sensor (accelerometer). It has a resolution of 8,10 and 12 bits, and the program sets the measuring range to 1g, 2g, 4g, and 8g.

We often use the accelerometer to detect the attitude of machines.

In this project, we will introduce the detection of several special postures by the accelerometer, then view the triaxial raw data output by the it.

2. Components Needed

		
Micro:bit * 1	USB Cable * 1	

3. Test Code

You can upload the code directly from the tutorial (read the "**Development Environment Configuration**" file if in doubt).

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Code1:

```
from microbit import *

while True:
    gesture = accelerometer.current_gesture()

    if gesture == "shake":
        display.show("1")
    if gesture == "up":
        display.show("2")
    if gesture == "down":
        display.show("3")
    if gesture == "face up":
        display.show("4")
    if gesture == "face down":
        display.show("5")
    if gesture == "left":
        display.show("6")
    if gesture == "right":
        display.show("7")
    if gesture == "freefall":
        display.show("8")
```

Test Result: Download code 1 to micro:bit board and plug in power with USB cable, then shake the Micro:bit board, the number 1 appears.

When the logo is up, the number 2 is displayed:

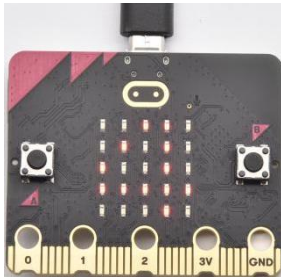


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When the logo is down, the number 3 is displayed:



When the screen is up, the number 4 is shown.



On the contrary, the number 5 is displayed when the screen is down.

When Micro:bit board is tilt to the left, number 6 is shown.



When Micro:bit board is inclined to the right, number 7 is displayed.



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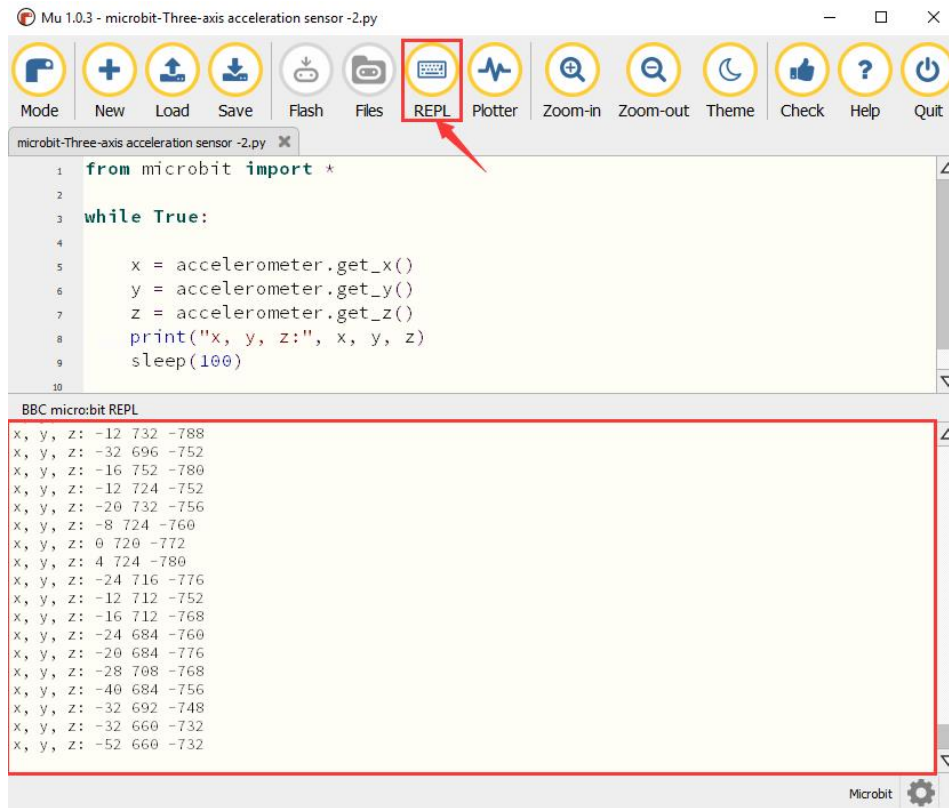
When it is free fall, number 8 will appear on dot matrix. (Note: we don't recommend you to make it free fall, it will cause board damage)

Code1:

```
from microbit import *  
  
while True:  
  
    x = accelerometer.get_x()  
  
    y = accelerometer.get_y()  
  
    z = accelerometer.get_z()  
  
    print("x, y, z:", x, y, z)  
  
    sleep(100)
```

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Test Result: Download code 2 to micro:bit board and plug in power with USB cable, **click “REPL”** and **press the reset button on micro:bit**. Then REPL window will show the breakdown of the micro: bit acceleration along the X, Y, and Z axes, as shown below:



The screenshot shows the Keyestudio Mu editor interface. The top toolbar includes buttons for Mode, New, Load, Save, Flash, Files, REPL (highlighted with a red box and arrow), Plotter, Zoom-in, Zoom-out, Theme, Check, Help, and Quit. The main editor window displays a Python script for a micro:bit three-axis acceleration sensor. Below the editor is the BBC micro:bit REPL window, which shows the output of the script as a series of X, Y, and Z acceleration values.

```
1 from microbit import *
2
3 while True:
4     x = accelerometer.get_x()
5     y = accelerometer.get_y()
6     z = accelerometer.get_z()
7     print("x, y, z:", x, y, z)
8     sleep(100)
9
10
```

BBC micro:bit REPL

```
x, y, z: -12 732 -788
x, y, z: -32 696 -752
x, y, z: -16 752 -780
x, y, z: -12 724 -752
x, y, z: -20 732 -756
x, y, z: -8 724 -760
x, y, z: 0 720 -772
x, y, z: 4 724 -780
x, y, z: -24 716 -776
x, y, z: -12 712 -752
x, y, z: -16 712 -768
x, y, z: -24 684 -760
x, y, z: -20 684 -776
x, y, z: -28 708 -768
x, y, z: -40 684 -756
x, y, z: -32 692 -748
x, y, z: -32 660 -732
x, y, z: -52 660 -732
```

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4. Code Explanation

from microbit import *	Import the library file of micro:bit
gesture = accelerometer.current_gesture()	Set accelerometer.current_gesture() to gesture
while True:	This is a permanent loop that makes micro:bit execute the code of it.
if gesture == "shake": display.show("1") if gesture == "up": display.show("2") if gesture == "down": display.show("3") if gesture == "face up": display.show("4") if gesture == "face down": display.show("5") if gesture == "left": display.show("6") if gesture == "right": display.show("7")	Shaking micro:bit board, number 1 will appear When log points to the North, number 2 will show up. When log points to the South, number 3 will be shown When the LED dot matrix is upward, the number 4 is shown. the number 5 is displayed when the LED dot matrix is downward. When Micro:bit board is tilt to the left, number 6 is shown. When micro:bit is tilt to the right When Micro:bit board is inclined to the right, number 7 is displayed.

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<code>if gesture == "freefall":</code> <code>display.show("8")</code>	When it is free fall(accidentally making it fall), number 8 appears on dot matrix.
<code>x = accelerometer.get_x()</code> <code>y = accelerometer.get_y()</code> <code>z = accelerometer.get_z()</code>	<p>Read the acceleration value on x axis, the return value is integer, and set x= the read value on x axis</p> <p>Read the acceleration value on y axis, the return value is integer, and set y= the read value on y axis</p> <p>Read the acceleration value on z axis, the return value is integer, and set z= the read value on z axis</p>
<code>print("x, y, z:", x, y, z)</code>	The value of acceleration will be shown
<code>sleep(100)</code>	Delay in 100ms