

# Keyestudio

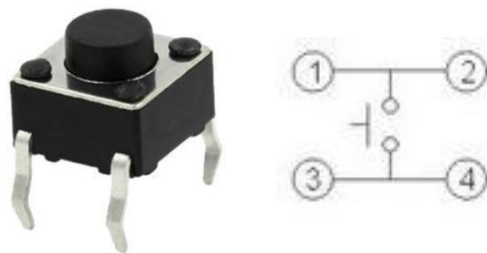
## Project 4: Programmable Buttons

### 1. Description

The button can control the on and off of the circuit, which is attached to the circuit. The circuit is disconnected when the button is not pressed. The circuit is connected as soon as it is pressed, but it is disconnected after being released.

Both ends of button are like two mountains. There is a river in between.

The internal metal piece connect the two sides to let the current pass, just like building a bridge to connect the two mountains.



(Internal Structure)

**Working Principle:** Before pressing the button, 1, 2, 3 and 4 are switched on, but 1, 3 or 1, 4 or 2, 3 or 2, 4 is disconnected (blocked), which will be on when the button is pressed.

Micro:bit board has three buttons, the reset button is on the back and two programmable buttons are on the front. Press A, B and AB at the same time respectively, and the corresponding screen displays them respectively.

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## 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).

Code1:

```
from microbit import *

while True:
    if button_a.is_pressed():
        display.show("A")
    elif button_a.is_pressed() and button_b.is_pressed():
        display.scroll("AB")
    elif button_b.is_pressed():
        display.show("B")
```

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Test Result: Upload code 1 and plug in micro:bit via USB cable, press "A" on Micro:bit board, character "A" will be displayed; in case that B is pressed, letter "B" will appear. "AB" will be displayed if you press A and B buttons simultaneously.

## Code2:

```
from microbit import *  
  
a = 0  
b = 0  
  
val1 = Image("00000:""00000:""00000:""00000:""00900")  
val2 = Image("00000:""00000:""00000:""00900:""99999")  
val3 = Image("00000:""00000:""00900:""99999:""99999")  
val4 = Image("00000:""00900:""99999:""99999:""99999")  
val5 = Image("00900:""99999:""99999:""99999:""99999")  
val6 = Image("99999:""99999:""99999:""99999:""99999")  
  
display.show(val1)
```

while True:

```
    while button_a.is_pressed() == True:  
        sleep(10)
```

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```
if button_a.is_pressed() == False:
    a = a + 1
    if(a >= 5):
        a = 5
    break
while button_b.is_pressed() == True:
    sleep(10)
    if button_b.is_pressed() == False:
        a = a - 1
        if(a <= 0):
            a = 0
        break
if a == 0:
    display.show(val1)
if a == 1:
    display.show(val2)
if a == 2:
    display.show(val3)
if a == 3:
    display.show(val4)
```

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```
if a == 4:  
    display.show(val5)  
  
if a == 5:  
    display.show(val6)
```

Test Result: Upload code 2 and plug in board via USB cable. Press button A, the number of rows lit by the LED dot matrix will increase, when B is pressed, the number of rows lit by the LED dot matrix will decrease.

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## 4. Code Explanation

<b>from</b> microbit <b>import</b> *	Import the library file of micro:bit
<b>while True:</b>	This is a permanent loop that makes micro:bit execute the code of it.
<b>if</b> button_a.is_pressed(): display.show("A") <b>elif</b> button_a.is_pressed() <b>and</b> button_b.is_pressed(): display.scroll("AB") <b>elif</b> button_b.is_pressed(): display.show("B")	If button A is pressed micro:bit shows "A" If button A and B are pressed at same time micro:bit displays "AB" If button B is pressed micro:bit shows "B"
<b>while</b> button_a.is_pressed() == <b>True</b> : sleep(10) <b>if</b> button_a.is_pressed() == <b>False</b> : a = a + 1 <b>if</b> (a >= 5): a = 5 break <b>while</b> button_b.is_pressed() == <b>True</b> :	When the button A is pressed Delay in 10ms to eliminate the shaking of button A when button A is released, Variable a adds 1 If variable $a \geq 5$ Variable a=5 exit the loop

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<pre>sleep(10) <b>if</b> button_b.is_pressed() == <b>False</b>: a = a - 1 <b>if</b>(a &lt;= 0): a = 0 break <b>if</b> a == 0: display.show(val1) <b>if</b> a == 1: display.show(val2) <b>if</b> a == 2: display.show(val3) <b>if</b> a == 3: display.show(val4) <b>if</b> a == 4: display.show(val5) <b>if</b> a == 5: display.show(val6)</pre>	<p>when button B is pressed</p> <p>Delay in 10ms to eliminate the shaking of button B</p> <p>When the button B is released</p> <p>Variable a reduces 1 gradually</p> <p>When <math>a \leq 0</math></p> <p>Variable <math>a=0</math></p> <p>exit the loop</p> <p>When <math>a=0</math></p> <p>micro:bit shows pattern val1</p> <p>When <math>a=1</math></p> <p>micro:bit displays pattern val2</p> <p>When <math>a=2</math></p> <p>micro:bit shows pattern val3</p> <p>If <math>a=3</math></p> <p>micro:bit displays pattern val4</p> <p>If <math>a=4</math></p> <p>micro:bit shows pattern val5</p> <p>If <math>a=5</math></p> <p>micro:bit displays pattern val6</p>
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