

YFROBOT

Micro:Bit基础课程

Micro:Bit V2专属

第四课

MP3音乐播放器

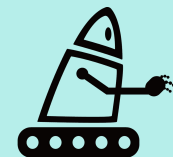
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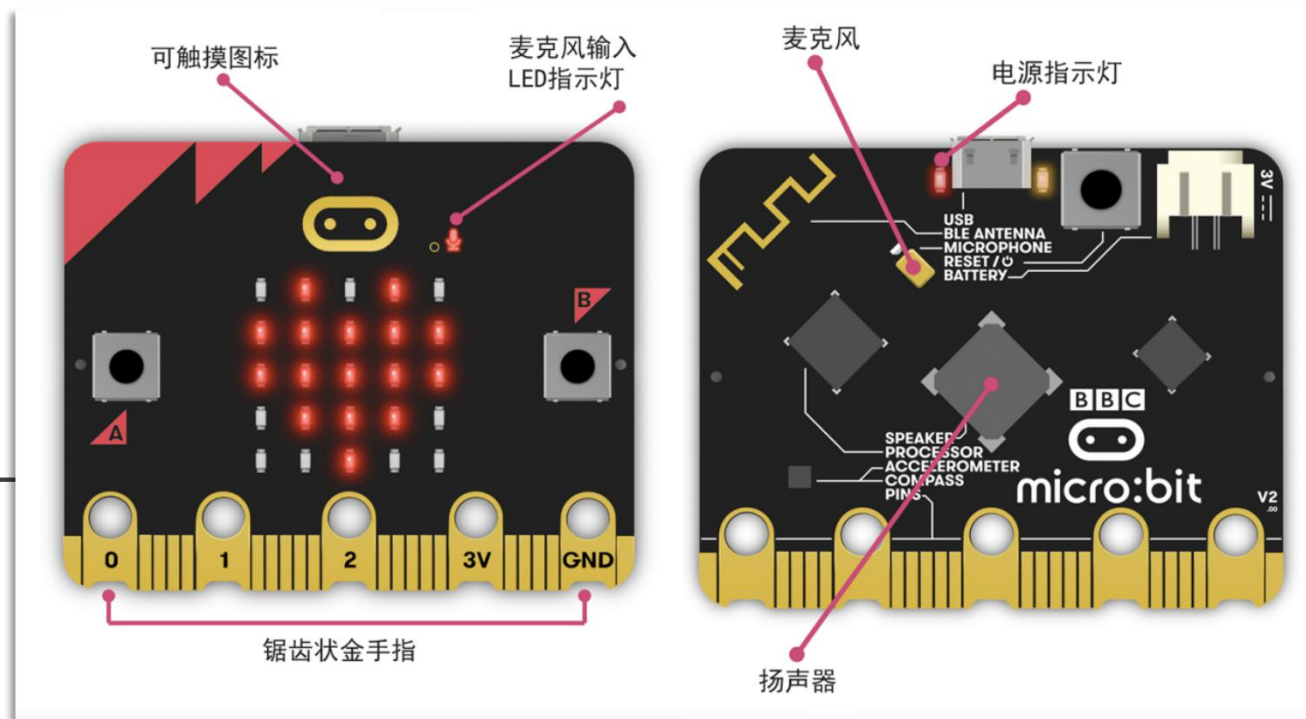
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V2主板新特征



*板载扬声器

*带LED指示灯的麦克风

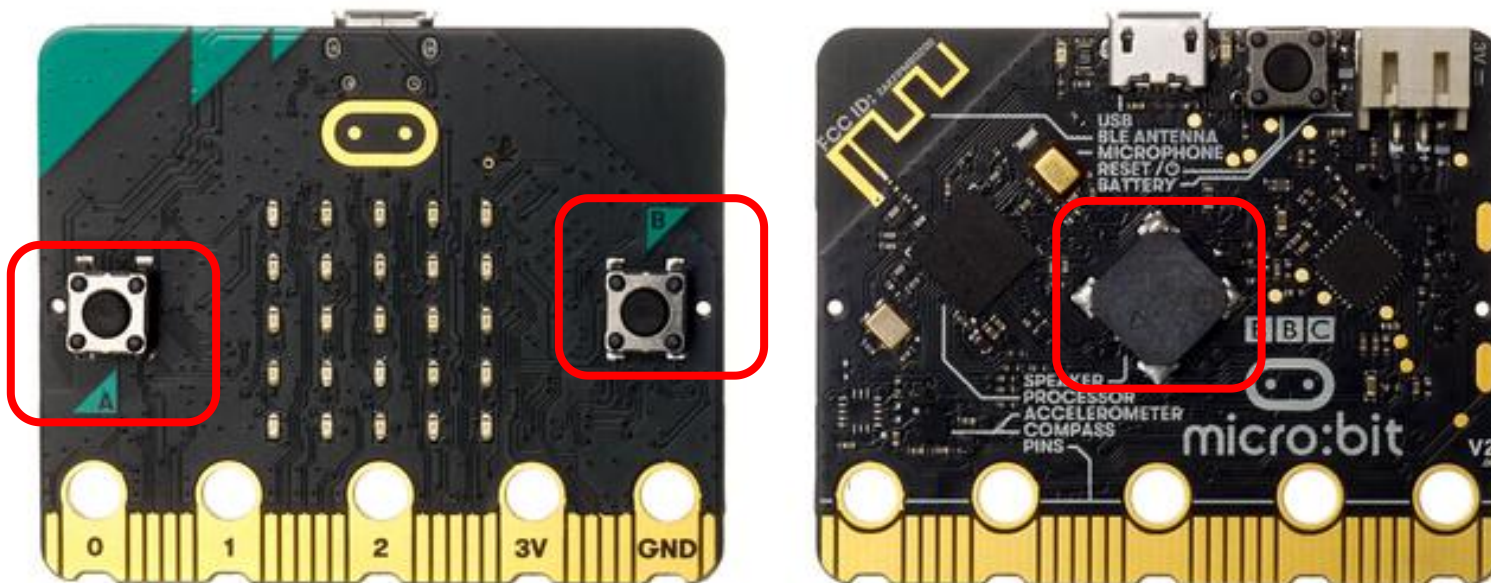
*触控式徽标

*内置睡眠/关闭模式，这意味着板可以在连接电池的情况下断电

*可向外部附件提供高达 190mA 电流的分立式稳压器

Part 1

学习目标



本次课我们要学习使用micro:bit V2板载蜂鸣器和按键；使用编程器MakeCode内置2.0程序块，实现按下A按键，切换下一首歌曲，按B按键，切换上一首歌曲效果。

Part 2



课前准备

器材准备：

- Micro:bit主板 V2*1
- USB数据线*1
- 一台可以上网的电脑

然后将Micro:Bit通过USB连接电脑，电脑会弹出一个名为“MICROBIT”U盘，
MakeCode编辑器登陆网址：
<https://MakeCode.Micro:Bit.org>，即可进入了编程页面。

Part 3

编程实验

基本栏
显示图标、当
开机时程序块

Microsoft MakeCode for micro:bit

搜索...

基本

输入

音乐

LED

无线

循环

逻辑

变量

数学

高级

函数

数组

文本

游戏

图像

引脚

串行

控制

扩展

显示图标

显示字符串 "Hello!"

清空屏幕

无限循环

当开机时

暂停 (ms) 100

显示箭头 北

下载

课程4-MP3音乐播放器

当按钮 A 被按下时

以 1 为幅度更改 i

如果为 i > 4 则

将 i 设为 1

调用 播放歌曲

当按钮 B 被按下时

以 -1 为幅度更改 i

如果为 i < 1 则

将 i 设为 4

调用 播放歌曲

函数 播放歌曲

停止旋律 全部

如果为 i = 1 则

播放旋律 power up 重复 播放一次

显示图标

否则如果为 i = 2 则

播放旋律 prelude 重复 播放一次

显示图标

否则如果为 i = 3 则

播放旋律 blues 重复 播放一次

显示图标

否则如果为 i = 4 则

播放旋律 nyan 重复 播放一次

显示图标

Part 3

编程实验

输入栏
当按键被按下时
程序块

The screenshot shows the Microsoft MakeCode for micro:bit editor interface. On the left, there is a visual representation of a micro:bit board with a USB cable connected. Below it are playback controls. The central pane shows a search bar and a category list with '输入' (Input) selected. The right pane displays the code blocks for the program:

- 当按钮 A 被按下时** (When button A is pressed):
 - 以 1 为幅度更改 i
 - 如果为 i > 4 则:
 - 将 i 设为 1
 - 调用 播放歌曲
- 当按钮 B 被按下时** (When button B is pressed):
 - 以 -1 为幅度更改 i
 - 如果为 i < 1 则:
 - 将 i 设为 4
 - 调用 播放歌曲
- 函数 播放歌曲** (Function play song):
 - 停止旋律 全部
 - 如果为 i = 1 则:
 - 播放旋律 power up 重复 播放一次
 - 显示图标
 - 否则如果为 i = 2 则:
 - 播放旋律 prelude 重复 播放一次
 - 显示图标
 - 否则如果为 i = 3 则:
 - 播放旋律 blues 重复 播放一次
 - 显示图标
 - 否则如果为 i = 4 则:
 - 播放旋律 nyan 重复 播放一次
 - 显示图标

At the bottom, there is a '下载' (Download) button and a status bar showing '课程4-MP3音乐播放器'.

Part 3

编程实验

变量栏
新建变量: i

The screenshot shows the Microsoft MakeCode for micro:bit editor interface. On the left, a physical micro:bit board is connected to a USB cable. The central workspace displays a JavaScript script with several blocks: a '当按钮 A 被按下时' (When button A is pressed) event block, followed by '以 1 为幅度更改 i' (Change i by 1), an '如果为 i > 4 则' (If i > 4) conditional block containing '将 i 设为 1' (Set i to 1), and a '调用 播放歌曲' (Call play song) block. A '函数 播放歌曲' (Function play song) block is also visible on the right, containing a sequence of '播放旋律' (Play melody) blocks: 'power up', 'prelude', 'blues', and 'nyan'. A '设置变量' (Set variable) dialog box is open in the center, with the text '新变量的名称:' (New variable name:) and a text input field containing the letter 'i'. A yellow box highlights the '设置变量' button in the top-left of the workspace, and another yellow box highlights the '确定' (OK) button in the dialog box. The bottom of the screen shows a '下载' (Download) button and the text '课程4-MP3音乐播放器' (Lesson 4-MP3 Music Player).



Part 3

编程实验

变量栏
变量i、设置i、
更改i程序块

The screenshot shows the Microsoft MakeCode for micro:bit editor. On the left, there is a sidebar with a search bar and a list of categories: 基本 (Basic), 输入 (Input), 音乐 (Music), LED, 无线 (Wireless), 循环 (Loops), 逻辑 (Logic), 变量 (Variables), 数学 (Math), 高级 (Advanced), 函数 (Functions), 数组 (Arrays), 文本 (Text), 游戏 (Games), 图像 (Images), 引脚 (Pins), 串行 (Serial), 控制 (Control), and 扩展 (Extensions). The '变量' (Variables) category is selected, and the '设置变量' (Set Variable) block is highlighted. Below it, the variable 'i' is defined, and the '将 i 设为 0' (Set i to 0) and '以 1 为幅度更改 i' (Change i by 1) blocks are highlighted with a yellow box. The main workspace shows two event-driven blocks: '当按钮 A 被按下时' (When button A is pressed) and '当按钮 B 被按下时' (When button B is pressed). Each block contains a sequence of steps: '以 1 为幅度更改 i' (Change i by 1), an '如果为 i > 4 则' (If i > 4) condition, '将 i 设为 1' (Set i to 1), and '调用 播放歌曲' (Call play song). The '播放歌曲' function block is expanded, showing a '停止旋律 全部' (Stop melody all) block, followed by a series of '如果为 i = 1 则' (If i = 1) conditions, each leading to a '播放旋律' (Play melody) block (e.g., 'power up', 'prelude', 'blues', 'nyan') and a '显示图标' (Show icon) block. The bottom of the editor shows a '下载' (Download) button and a '课程4-MP3音乐播放器' (Course 4-MP3 Music Player) title.

Part 3

编程实验

逻辑栏
判断、比较程
序块

The screenshot shows the Microsoft MakeCode for micro:bit editor interface. On the left, a physical micro:bit board is connected to a USB cable. The central panel displays the '逻辑' (Logic) block palette, which is categorized into '条件' (Conditions), '比较' (Comparisons), and '布尔值' (Boolean). The '比较' section is highlighted, showing various comparison operators like '等于' (equals), '大于' (greater than), and '小于' (less than). On the right, a script is visible, featuring two event-driven blocks: '当按钮 A 被按下时' (When button A is pressed) and '当按钮 B 被按下时' (When button B is pressed). Each event block contains a sequence of actions: setting a variable 'i' to a specific value (1 or 4), followed by a conditional '如果为' (if) block that checks the value of 'i'. Depending on the condition, it triggers the '调用播放歌曲' (call play song) block with different song titles like 'power up', 'prelude', 'blues', and 'nyan'. A '函数 播放歌曲' (function play song) block is also visible on the right, containing a series of '播放旋律' (play melody) blocks for different songs.

Part 3

编程实验

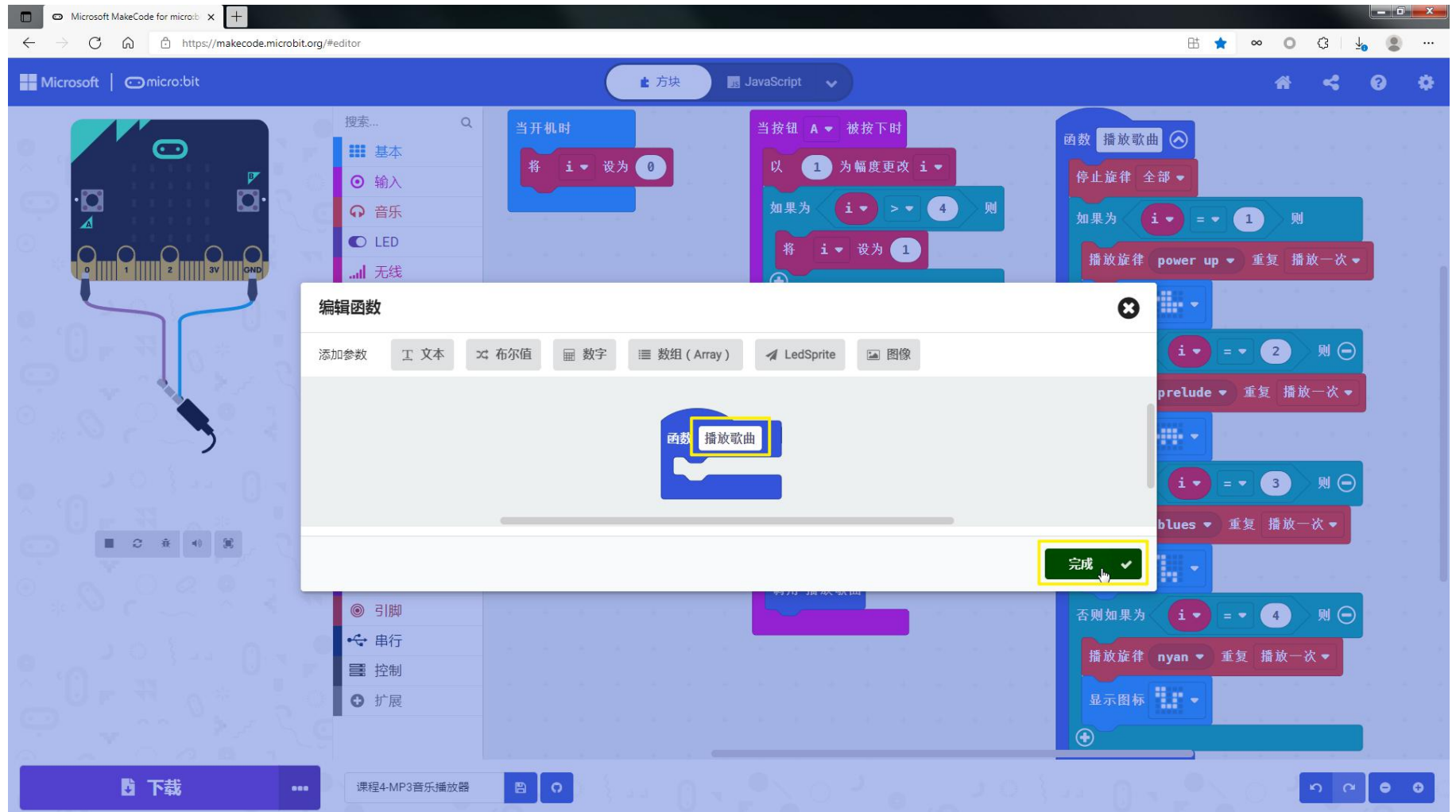
函数栏
创建函数：播
放歌曲

The screenshot shows the Microsoft MakeCode for micro:bit editor interface. On the left, a physical micro:bit board is connected to a USB cable. The central pane displays the '函数' (Functions) block palette, with the '创建一个函数' (Create a function) block highlighted. Below it, the '返回: 0' (Return: 0) block is visible. The right pane shows a program with two event-driven blocks: '当按钮 A 被按下时' (When button A is pressed) and '当按钮 B 被按下时' (When button B is pressed). Each event block contains a sequence of blocks: '以 1 为幅度更改 i' (Change i by 1), an '如果为 i > 4 则' (If i > 4) condition, and '将 i 设为 1' (Set i to 1). The '当按钮 B 被按下时' block has a similar sequence but with '以 -1 为幅度更改 i' (Change i by -1) and '如果为 i < 1 则' (If i < 1). A custom function block '函数 播放歌曲' (Function play song) is used to call the '播放歌曲' (Play song) block. This function block contains a loop of '播放旋律' (Play melody) blocks for 'power up', 'prelude', 'blues', and 'nyan', each followed by a '显示图标' (Show icon) block. The bottom of the editor shows a '下载' (Download) button and a '课程4-MP3音乐播放器' (Lesson 4-MP3 Music Player) title.

Part 3

编程实验

函数栏
创建函数：播
放歌曲



Part 3

编程实验

函数栏
调用函数：播
放歌曲

The screenshot displays the Microsoft MakeCode for micro:bit editor interface. On the left, a physical micro:bit board is shown with a USB cable connected. The central pane shows a JavaScript function named "播放歌曲" (Play Song). The function is defined with a return value of 0 and is being called from two event handlers: "当按钮 A 被按下时" (When button A is pressed) and "当按钮 B 被按下时" (When button B is pressed). The "播放歌曲" function itself contains a loop that plays different melodies based on the value of a variable 'i'.

```
function 播放歌曲() {  
  返回: 0  
}  
  
当按钮 A 被按下时  
  以 1 为幅度更改 i  
  如果为 i > 4 则  
    将 i 设为 1  
  调用 播放歌曲  
  
当按钮 B 被按下时  
  以 -1 为幅度更改 i  
  如果为 i < 1 则  
    将 i 设为 4  
  调用 播放歌曲  
  
函数 播放歌曲  
  停止旋律 全部  
  如果为 i = 1 则  
    播放旋律 power up 重复 播放一次  
    显示图标  
  否则如果为 i = 2 则  
    播放旋律 prelude 重复 播放一次  
    显示图标  
  否则如果为 i = 3 则  
    播放旋律 blues 重复 播放一次  
    显示图标  
  否则如果为 i = 4 则  
    播放旋律 nyan 重复 播放一次  
    显示图标
```

Part 3

编程实验

音乐栏
播放旋律程序
块

The screenshot displays the Microsoft MakeCode for micro:bit editor interface. On the left, a sidebar lists various block categories, with '音乐' (Music) highlighted. The main workspace contains a sequence of music-related blocks: '将节奏更改 (bpm) 20' (Change tempo to 20 bpm), '将节奏设定为 (bpm) 120' (Set tempo to 120 bpm), '1 节拍' (1 beat), '节奏 (bpm)' (Tempo), '旋律高级版' (Advanced Melody), '播放旋律 dadadum 重复 播放一次' (Play melody: dadadum, repeat once), '停止旋律 全部' (Stop melody: all), '播放 播放旋律音符 时响起音乐' (Play melody notes when music starts), and 'micro:bit (V2)' (micro:bit V2) section with '播放声音 咯咯笑 直到结束' (Play sound: giggles until end), '播放声音 咯咯笑' (Play sound: giggles), and '设置内置扬声器 关' (Set built-in speaker: off). On the right, a function block '播放歌曲' (Play Song) is shown, containing a loop of '播放旋律' (Play melody) blocks for 'power up', 'prelude', 'blues', and 'nyan', each with a '显示图标' (Show icon) block. The bottom of the editor shows a '下载' (Download) button and a '课程4-MP3音乐播放器' (Course 4-MP3 Music Player) title bar.

Part 3

编程实验

组合程序

https://makecode.microbit.org/_dgkPCe87rWjY

The screenshot shows the Microsoft MakeCode editor for micro:bit. The interface includes a toolbar at the top with 'Microsoft' and 'micro:bit' logos, and a 'JavaScript' dropdown menu. On the left, there is a sidebar with a search bar and a list of categories: 基本 (Basic), 输入 (Input), 音乐 (Music), LED, 无线 (Wireless), 循环 (Loops), 逻辑 (Logic), 变量 (Variables), 数学 (Math), 高级 (Advanced), 函数 (Functions), 数组 (Arrays), 文本 (Text), 游戏 (Games), 图像 (Images), 引脚 (Pins), 串行 (Serial), 控制 (Control), and 扩展 (Extensions). The main workspace displays a JavaScript program with the following logic:

- 当开机时 (When the device starts):** 将 `i` 设为 `0` (Set `i` to `0`).
- 当按钮 A 被按下时 (When button A is pressed):**
 - 以 `1` 为幅度更改 `i` (Change `i` by `1`).
 - 如果为 `i > 4` 则 (If `i > 4`): 将 `i` 设为 `1` (Set `i` to `1`).
 - 调用 播放歌曲 (Call play song).
- 当按钮 B 被按下时 (When button B is pressed):**
 - 以 `-1` 为幅度更改 `i` (Change `i` by `-1`).
 - 如果为 `i < 1` 则 (If `i < 1`): 将 `i` 设为 `4` (Set `i` to `4`).
 - 调用 播放歌曲 (Call play song).
- 函数 播放歌曲 (Function play song):**
 - 停止旋律 全部 (Stop all melodies).
 - 如果为 `i = 1` 则 (If `i = 1`): 播放旋律 `power up` 重复 播放一次 (Play melody `power up` once).
 - 显示图标 (Show icon).
 - 否则如果为 `i = 2` 则 (Else if `i = 2`): 播放旋律 `prelude` 重复 播放一次 (Play melody `prelude` once).
 - 显示图标 (Show icon).
 - 否则如果为 `i = 3` 则 (Else if `i = 3`): 播放旋律 `blues` 重复 播放一次 (Play melody `blues` once).
 - 显示图标 (Show icon).
 - 否则如果为 `i = 4` 则 (Else if `i = 4`): 播放旋律 `nyan` 重复 播放一次 (Play melody `nyan` once).
 - 显示图标 (Show icon).

At the bottom, there is a '下载' (Download) button and a title bar for the program: '课程4-MP3音乐播放器' (Lesson 4-MP3 Music Player).

Part 4 “

拓展思考

本次课模拟制作了一个MP3播放器，实现按下A按键，切换下一首歌曲，按下B按键切换上一首歌曲。

今天的课程你学会了吗？

如果学会了就给自己一个顶呱呱吧~

现在布置一个课后作业给你哦~

程序块中还有其他音乐程序块，尝试给你的MP3增加歌曲，并试试看效果吧~~





谢谢观看!

Micro:Bit 基础课程