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摘要： microbit， music

⼀。创意介绍：

对上⾯的发⾳功能有兴趣，所以打算写⼏⾸旋律。本想多整⼀点曲⼦，但music只⽀持偶数

分⾳符，⽽且写music⼗分繁琐，所以从古典和流⾏分别选取了两段旋律规整且⼈⺠群众喜

闻乐⻅的乐曲。

(喇叭声⾳实在寒碜，⽽且只能放单⾳，差点给舍友赶出去)

1.D⼤调卡农

2.只因你太美(部分旋律)

由于放假，任务不妨分为若⼲天慢慢完成： 5.3-5.7

⼆。三。设计⽅案和历程，与代码分析：

5.3

项⽬主要引进了music, random,speech

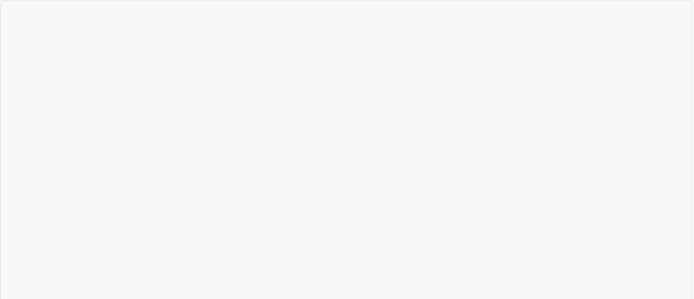
from microbit import \*

import music

import random

import speech

按照使⽤习惯创建了最常⽤的三个8度： c3-c4,c4-c5.c5-c6,(⼿打， sigh)



# 定义不同⾳符和节奏的频率和时⻓

c31 = {7: 'b3:1',1.5: 'c#3:1',2: 'd3:1',2.5: 'd#3:1',3: 'e3:1',

4: 'f3:1',4.5: 'f#3:1',5: 'g3:1',5.5: 'g#3:1',6: 'a3:1',

6.5: 'a#3:1',1: 'c3:1'}

c41 = {7: 'b4:1',1.5: 'c#4:1',2: 'd4:1',2.5: 'd#4:1',3: 'e4:1',

4: 'f4:1',4.5: 'f#4:1',5: 'g4:1',5.5: 'g#4:1',6: 'a4:1',

6.5: 'a#4:1',1: 'c4:1'}

c51 = {7: 'b5:1',1.5: 'c#5:1',2: 'd5:1',2.5: 'd#5:1',3: 'e5:1',

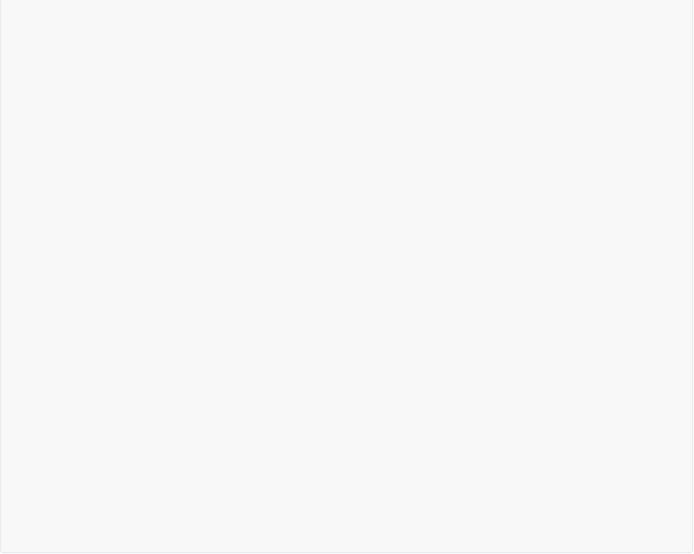
4: 'f5:1',4.5: 'f#5:1',5: 'g5:1',5.5: 'g#5:1',6: 'a5:1',

6.5: 'a#5:1',1: 'c5:1'}

c32 = {7: 'b3:2',1.5: 'c#3:2',2: 'd3:2',2.5: 'd#3:2',3: 'e3:2',

4: 'f3:2',4.5: 'f#3:2',5: 'g3:2',5.5: 'g#3:2',6: 'a3:2',

6.5: 'a#3:2',1: 'c3:2'}



c42 = {7: 'b4:2',1.5: 'c#4:2',2: 'd4:2',2.5: 'd#4:2',3: 'e4:2',

4: 'f4:2',4.5: 'f#4:2',5: 'g4:2',5.5: 'g#4:2',6: 'a4:2',

6.5: 'a#4:2',1: 'c4:2'}

c52 = {7: 'b5:2',1.5: 'c#5:2',2: 'd5:2',2.5: 'd#5:2',3: 'e5:2',

4: 'f5:2',4.5: 'f#5:2',5: 'g5:2',5.5: 'g#5:2',6: 'a5:2',

6.5: 'a#5:2',1: 'c5:2'}

c33 = {7: 'b3:3',1.5: 'c#3:3',2: 'd3:3',2.5: 'd#3:3',3: 'e3:3',

4: 'f3:3',4.5: 'f#3:3',5: 'g3:3',5.5: 'g#3:3',6: 'a3:3',

6.5: 'a#3:3',1: 'c3:3'}

c43 = {7: 'b4:3',1.5: 'c#4:3',2: 'd4:3',2.5: 'd#4:3',3: 'e4:3',

4: 'f4:3',4.5: 'f#4:3',5: 'g4:3',5.5: 'g#4:3',6: 'a4:3',

6.5: 'a#4:3',1: 'c4:3'}

c53 = {7: 'b5:3',1.5: 'c#5:3',2: 'd5:3',2.5: 'd#5:3',3: 'e5:3',

4: 'f5:3',4.5: 'f#5:3',5: 'g5:3',5.5: 'g#5:3',6: 'a5:3',

6.5: 'a#5:3',1: 'c5:3'}

c34 = {7: 'b3:4',1.5: 'c#3:4',2: 'd3:4',2.5: 'd#3:4',3: 'e3:4',

4: 'f3:4',4.5: 'f#3:4',5: 'g3:4',5.5: 'g#3:4',6: 'a3:4',

6.5: 'a#3:4',1: 'c3:4'}

c44 = {7: 'b4:4',1.5: 'c#4:4',2: 'd4:4',2.5: 'd#4:4',3: 'e4:4',

4: 'f4:4',4.5: 'f#4:4',5: 'g4:4',5.5: 'g#4:4',6: 'a4:4',

6.5: 'a#4:4',1: 'c4:4'}

c54 = {7: 'b5:4',1.5: 'c#5:4',2: 'd5:4',2.5: 'd#5:4',3: 'e5:4',

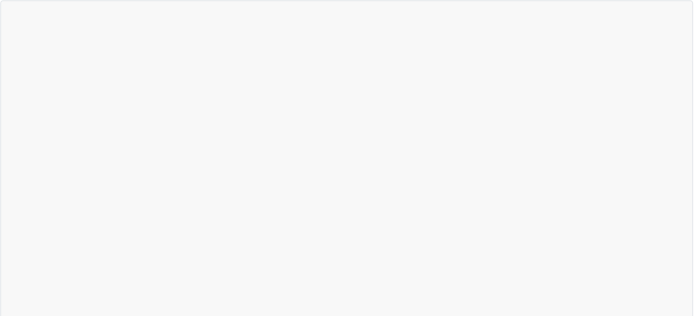
4: 'f5:4',4.5: 'f#5:4',5: 'g5:4',5.5: 'g#5:4',6: 'a5:4',

6.5: 'a#5:4',1: 'c5:4'}

5.4

开始旋律，将应有的和弦省略或分解了，直接按记忆尽可能好听⼀点的来写：

每⾏⼤概就是⼀个⼩节，四⼆的拍⼦



PACHELBEL = [

c52[4.5], c42[4.5], c42[6], c52[2],

c52[3],c42[3],c42[6],c52[1.5],

c52[2],c42[2],c42[4.5],c42[7],

c52[1.5],c42[1.5],c42[3],c42[6],

c42[7],c32[7],c42[2],c42[5],

c42[6],c32[6],c42[1.5],c42[3],

c42[7],c42[2],c42[4.5],c42[7],

c52[1.5],c42[3],c42[6],c52[1.5],

c42[2],c32[4.5],c42[4.5],c32[2],

c42[6],c32[6],c42[5],c42[1.5],

c42[4.5],c32[4.5],c42[2],c32[6],

c42[4.5],c32[4.5],c42[3],c32[5],

c42[2],c32[4.5],c32[7],c32[4.5],

c42[2],c32[4.5],c32[6],c32[2],

c42[5],c42[3],c42[7],c42[1.5],

c42[6],c42[1.5],c42[5],c42[3],

c52[2],c52[1.5],c52[2],c42[2],

c42[1.5],c42[6],c42[3],c42[4.5],

c42[2],c52[2],c52[1.5],c42[7],

c52[1.5],c52[4.5],c52[6],c52[7],

c52[5],c52[4.5],c52[3],c52[5],

c52[4.5],c52[3],c52[2],c52[1.5],

c42[7],c42[6],c42[5],c42[4.5],

c42[3],c42[5],c42[4.5],c42[3],

c52[6],c51[4.5],c51[5],c52[6],c51[4.5],c51[5],

c51[6],c41[6],c41[7],c51[1.5],c51[2],c51[3],c51[4.5],c51[5],

c52[4.5],c51[2],c51[3],c52[4.5],c41[4.5],c41[5],

c41[6],c41[7],c41[6],c41[5],c41[6],c41[4.5],c41[5],c41[6],

c42[5],c41[7],c41[6],c42[5],c41[4.5],c41[3],

c41[4.5],c41[3],c41[2],c41[3],c41[4.5],c41[5],c41[6],c41[7],

c42[5],c41[7],c41[6],c42[7],c51[1.5],c51[2],

c41[6],c41[7],c51[1.5],c51[2],c51[3],c51[4.5],c51[5],c51[6],

c52[6],c51[4.5],c51[5],c52[6],c51[4.5],c51[5],

c51[6],c41[6],c41[7],c51[1.5],c51[2],c51[3],c51[4.5],c51[5],

c52[4.5],c51[2],c51[3],c52[4.5],c41[4.5],c41[5],

c41[6],c41[7],c41[6],c41[5],c41[6],c51[2],c51[1.5],c51[2],

c42[7],c51[2],c51[1.5],c42[7],c41[6],c41[5],

c41[6],c41[5],c41[4.5],c41[5],c41[6],c41[7],c51[1.5],c51[2],

c42[7],c51[2],c51[1.5],c52[2],c51[1.5],c41[7],

c51[1.5],c51[2],c51[3],c51[2],c51[1.5],c51[2],c41[7],c51[1.5],

c52[2],c42[2],c52[3],c52[2],

c42[1.5],c52[1.5],c42[7],c52[1.5],

c32[7],c42[7],c52[1.5],c42[7],

c32[6],c42[6],c42[5],c42[6],

c42[5],c42[7],c52[1.5],c42[7],

c42[6],c32[6],c32[5],c32[6],

c32[5],c32[7],c32[6],c32[7],

c42[1.5],c52[1.5],c42[7],c52[1.5],

c42[2],c52[2],c52[3],c52[2],

c52[1.5],c42[1.5],c32[7],c42[1.5],

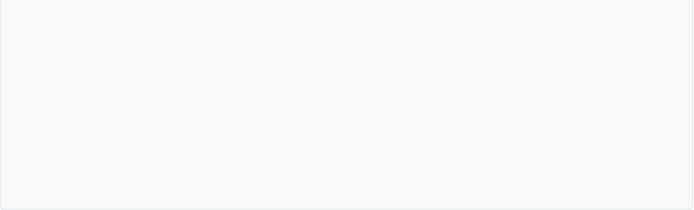
c42[2],c52[2],c52[3],c52[5],

c52[4.5],c42[4.5],c42[3],c42[4.5],

c52[5],c42[7],c52[2],c52[5],

c52[3],c42[3],c42[6],c52[1.5],

c52[2],c42[4.5],c42[6],c52[4.5],



c52[6],c52[7],c52[6],c52[5],

c52[4.5],c42[4.5],c42[6],c52[3],

c52[4.5],c52[5],c52[4.5],c52[3],

c52[2],c42[2],c42[5],c42[7],

c52[2],c52[1],c42[7],c52[1],

c42[6],c42[1.5],c42[3],c42[6],

c52[2],c52[1],c42[1],c52[1],

c52[1.5],c42[3],c42[6],c52[1.5],

c44[2],c42[4.5],c43[6],c53[1.5],c54[2]

]

再写⼀个播放函数 ，加上⼀些随机的⾃带的图案，以免过于单调

|  |
| --- |
| # 播放Pachelbel的D⼤调卡农  def Canon\_in\_D():  music.set\_tempo(bpm=130)  # 定义显示图案  images = [Image.HAPPY, Image.SAD, Image.YES,Image.NO,  Image.HEART, Image.SQUARE,Image.TRIANGLE,  Image.CLOCK12,  Image.CLOCK3,  Image.CLOCK6,  Image.CLOCK9,  Image.ARROW\_N,]  # 循环播放乐谱  for note in PACHELBEL:  music.play(note)  random\_image = random.choice(images)  display.show(random\_image)  display.clear()  # 停⽌播放和显示  music.stop()  display.clear() |

这样第⼀个旋律就治好了

###

写⼀个鸡叫声，引出下⽂，这是旋律的⼀部分

|  |
| --- |
| def cxk():  b1=speech.translate( 'ne' )  b2=speech.translate( 'gan')  b3=speech.translate( 'ma')  b4=speech.translate( 'ha')  b5=speech.translate( 'ha')  b6=speech.translate( 'ai')  b7=speech.translate( 'yo')  speech.say(b1)  speech.say(b2,pitch=40,speed=160)  speech.sing(b3,pitch=36,speed=224)  speech.sing(b4,speed=224)  speech.sing(b5,speed=223)  speech.sing(b6,speed=160)  speech.say(b7) |

5⽉6⽇

不知什么原因，鸡叫声好像有时候⽐较像，有时候很不像，不太稳定。原理是先翻译为⾳

标，然后读出来，然后微调频率。

写了只因你太美和迎⾯⾛来的你让我蠢蠢欲动的旋律(勉强能听出来)

|  |
| --- |
| # 定义播放列表  taimei = [  'f4:1', 'c5:2', 'c5:2', 'f4:1',  'r:4', 'r:4', 'c3:1', 'c3:1', 'r:4', 'c#3:1', 'c3:1',  'r:4', 'r:4', 'r:4',  'f5:1', 'c5:1', 'c5:1', 'c5:1', 'c5:1', 'c5:1', 'c5:1',  'c5:1', 'c5:1', 'c5:1', 'b4:1', 'c5:1',  'f4:1', 'c5:2', 'c5:2', 'f4:1',  'r:4', 'r:4', 'c3:1', 'c3:1', 'r:4', 'c#3:1', 'c3:1',  'r:4', 'r:4', 'r:4',  'f5:1', 'c5:1', 'c5:1', 'c5:1', 'c5:1', 'c5:1', 'c5:1',  'c5:1', 'c5:1', 'c5:1', 'b4:1' , 'c5:1',  'f4:1', 'c5:2', 'c5:2', 'f4:1',  'r:4', 'r:4', 'c3:1', 'c3:1', 'r:4', 'c#3:1', 'c3:1',  'r:4', 'r:4', 'r:4',  'f5:1', 'c5:1', 'c5:1', 'c5:1', 'c5:1', 'c5:1', 'c5:1',  'c5:1', 'c5:1', 'c5:1', 'b4:1', 'c5:1'] |

为增加乐趣，写了⼀点跳舞的动图(今天发现好像发⽣撞题，所以尽量简略实现之)

# 定义⼩⼈打篮球动画列表

basketball = [

Image("09960:"

"19099:"

"00900:"

"00900:"

"09090"),

Image("00790:"

"00989:"

"06986:"

"00900:"

"09090"),

Image("09960:"

"19099:"

"00900:"

"00900:"

"09090"),

Image("01790:"

"00989:"

"06986:"

"00900:"

"09090"),

Image("09960:"

"19099:"

"00900:"

"00900:"

"09090"),

Image("02790:"

"00989:"

"06986:"

"00900:"

"09090"),

]

# 定义转圈动画列表

circle = [

Image("00900:"

"09090:"

"09000:"

"00000:"

"00000"),

Image("00900:"

"09090:"

"00000:"

"09000:"

"00000"),

Image("00000:"

"00900:"

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"09090:"

"09000:"

"00000"),

Image("00000:"

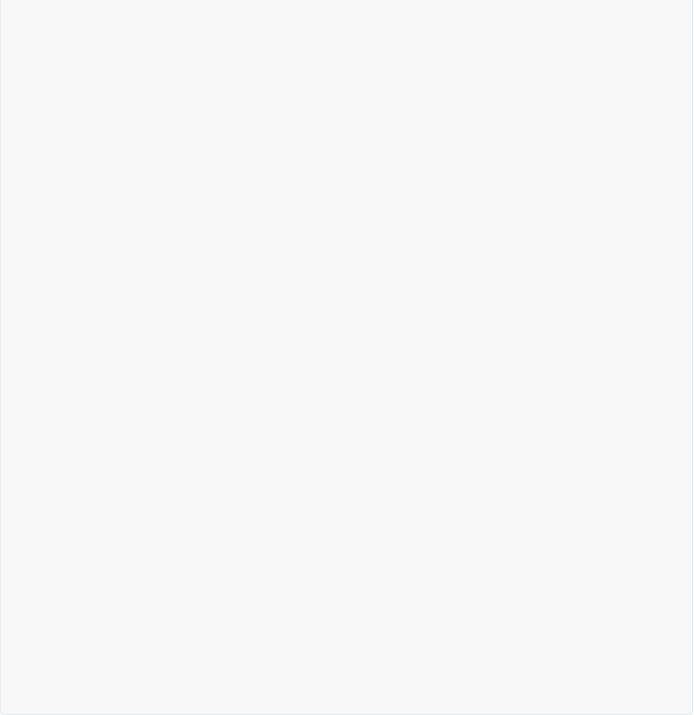
"00900:"

"09090:"

"00000:"

"09000"),

Image("00900:"

"09090:"

"00000:"

"09000:"

"00000"),

Image("00900:"

"09090:"

"00090:"

"00000:"

"00000"),

Image("00900:"

"09099:"

"00000:"

"00000:"

"00000"),

Image("00900:"

"09009:"

"00000:"

"00000:"

"00000"),

Image("00900:"

"09090:"

"00000:"

"00000:"

"00000"),

]

# 定义显示图案和动画的函数

def display\_animation(animation, speed=500, repeat=1):

for i in range(repeat):

for frame in animation:

display.show(frame)

sleep(speed)

display.clear()

经多次调试，达到了最清晰的效果

边唱边跳：

def chicken():

# 配置⾳乐播放器

music.set\_tempo(bpm=120)

for i in range(2):

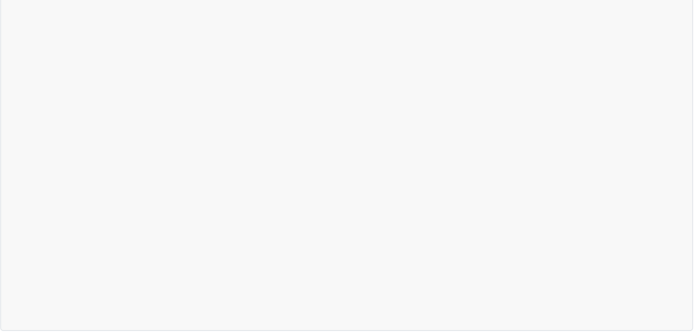
cxk()

# 循环播放播放列表中的曲⽬

music.play(taimei, pin=pin0, wait=False)

speech.say( 'be',speed=150)

speech.say( 'be',speed=150)



# 显示肩膀钴佣的动画

display\_animation(basketball, speed=225, repeat=3)

cxk()

sleep(50)

# 显示拍球扔球的动画

display\_animation(circle, speed=150, repeat=1)

sleep(150)

# 停⽌播放和清除显示

music.stop()

display.clear()

好了，两段旋律都完成了，按A播放第⼀段，按B播放第⼆段

while True:

if button\_a.is\_pressed():

Canon\_in\_D()

elif button\_b.is\_pressed():

chicken()

四。后续⼯作展望：

很有趣， 以后可以打更多的旋律进来。但打字确实很费劲， 因为每打⼀个⾳符需要⽐写乐谱

给多的时间， 但后来越打越快了。旋律还算是可以。除了⾳乐功能， 别的也了解了不少， 感

觉还很不错。 效果很拉， 但挺有趣， 所以做了这些⼯作， ⼤佬勿喷。

五。⼩组分⼯合作：

⼩组⼈数： 1⼈， 鞠志翔2200011035⼯学院