

# 基础控制\_声音

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## 声音

class Sound(object)

| 说明       | 方法   | 参数  | 返回值 |
|----------|--|---|-----|
| 播放曲调     | <code>play_tone(self, frequency, duration, delay=0.0, volume=100, play_type=PLAY_WAIT_FOR_COMPLETE)</code> | <code>frequency</code> : 频率 (hz)<br><code>duration</code> : 音的持续时间<br><code>delay</code> : 音之间的间隔时间<br><code>volume</code> : 音量 | 无   |
| 播放音符     | <code>play_note(self, note, duration, volume=100, play_type=PLAY_WAIT_FOR_COMPLETE)</code>                 | <code>note</code> 参数可见<br><code>_NOTE_FREQUENCIES</code> 中的内容, 分布是各个音符  | 无   |
| 播放文件     | <code>play_file(self, wav_file, volume=100, play_type=PLAY_WAIT_FOR_COMPLETE)</code>                       | 只支持wav格式  | 无   |
| 根据text说话 | <code>speak(self, text, espeak_opts='-a 200 -s 130', volume=100, play_type=PLAY_WAIT_FOR_COMPLETE)</code>  |   | 无   |
| 以百分比设置音量 | <code>set_volume(self, pct, channel=None)</code>   | <code>pct</code> 即音量百分比   | 无   |
| 获取当前音量   | <code>get_volume(self, channel=None)</code>  |   | 无   |
| 播放音乐     | <code>play_song(self, song, tempo=120, delay=0.05)</code>  | <code>song</code> 是一个包含了若干note名称音符的元组<br>只支持4/4拍<br><code>tempo</code> 是歌的节奏  | 无   |

### # 音符和音阶

```
_NOTE_FREQUENCIES = _make_scales((
('C0', 16.35),
('C#0/Db0', 17.32),
('D0', 18.35),
('D#0/Eb0', 19.45), # expanded in one entry per symbol by
_make_scales
('E0', 20.60),
('F0', 21.83),
```

### # 节拍

```
_NOTE_VALUES = {
'w': 1.,
'h': 1./2,
'q': 1./4,
'e': 1./8,
's': 1./16,
}
```

('F#0/Gb0', 23.12),  
( 'G0', 24.50),  
( 'G#0/Ab0', 25.96),  
( 'A0', 27.50),  
( 'A#0/Bb0', 29.14),  
( 'B0', 30.87),  
( 'C1', 32.70),  
( 'C#1/Db1', 34.65),  
( 'D1', 36.71),  
( 'D#1/Eb1', 38.89),  
( 'E1', 41.20),  
( 'F1', 43.65),  
( 'F#1/Gb1', 46.25),  
( 'G1', 49.00),  
( 'G#1/Ab1', 51.91),  
( 'A1', 55.00),  
( 'A#1/Bb1', 58.27),  
( 'B1', 61.74),  
( 'C2', 65.41),  
( 'C#2/Db2', 69.30),  
( 'D2', 73.42),  
( 'D#2/Eb2', 77.78),  
( 'E2', 82.41),  
( 'F2', 87.31),  
( 'F#2/Gb2', 92.50),  
( 'G2', 98.00),  
( 'G#2/Ab2', 103.83),  
( 'A2', 110.00),  
( 'A#2/Bb2', 116.54),  
( 'B2', 123.47),  
( 'C3', 130.81),  
( 'C#3/Db3', 138.59),  
( 'D3', 146.83),  
( 'D#3/Eb3', 155.56),  
( 'E3', 164.81),  
( 'F3', 174.61),  
( 'F#3/Gb3', 185.00),  
( 'G3', 196.00),  
( 'G#3/Ab3', 207.65),  
( 'A3', 220.00),  
( 'A#3/Bb3', 233.08),  
( 'B3', 246.94),

('C4', 261.63),  
('C#4/Db4', 277.18),  
('D4', 293.66),  
('D#4/Eb4', 311.13),  
('E4', 329.63),  
('F4', 349.23),  
('F#4/Gb4', 369.99),  
('G4', 392.00),  
('G#4/Ab4', 415.30),  
('A4', 440.00),  
('A#4/Bb4', 466.16),  
('B4', 493.88),  
('C5', 523.25),  
('C#5/Db5', 554.37),  
('D5', 587.33),  
('D#5/Eb5', 622.25),  
('E5', 659.25),  
('F5', 698.46),  
('F#5/Gb5', 739.99),  
('G5', 783.99),  
('G#5/Ab5', 830.61),  
('A5', 880.00),  
('A#5/Bb5', 932.33),  
('B5', 987.77),  
('C6', 1046.50),  
('C#6/Db6', 1108.73),  
('D6', 1174.66),  
('D#6/Eb6', 1244.51),  
('E6', 1318.51),  
('F6', 1396.91),  
('F#6/Gb6', 1479.98),  
('G6', 1567.98),  
('G#6/Ab6', 1661.22),  
('A6', 1760.00),  
('A#6/Bb6', 1864.66),  
('B6', 1975.53),  
('C7', 2093.00),  
('C#7/Db7', 2217.46),  
('D7', 2349.32),  
('D#7/Eb7', 2489.02),  
('E7', 2637.02),  
('F7', 2793.83),

('F#7/Gb7', 2959.96),  
( 'G7', 3135.96),  
( 'G#7/Ab7', 3322.44),  
( 'A7', 3520.00),  
( 'A#7/Bb7', 3729.31),  
( 'B7', 3951.07),  
( 'C8', 4186.01),  
( 'C#8/Db8', 4434.92),  
( 'D8', 4698.63),  
( 'D#8/Eb8', 4978.03),  
( 'E8', 5274.04),  
( 'F8', 5587.65),  
( 'F#8/Gb8', 5919.91),  
( 'G8', 6271.93),  
( 'G#8/Ab8', 6644.88),  
( 'A8', 7040.00),  
( 'A#8/Bb8', 7458.62),  
( 'B8', 7902.13)  
)