

GAME MUSIC COMPOSER

REVIEW TEMPO, METER, HARMONICS

ONE DAY

GAME MUSIC COMPOSER

REVIEW 10-20 MINUTES

CONCEPTS | FORM AND STRUCTURE 10-15 MINUTES

DEVELOPING SKILLS PRACTICE 50 MINUTES

SHORT BREAK 10 MINUTES

MEETING WITH DEVELOPER 15 MINUTES @11:00 AM

PROJECT PLANNING MEETING WITH INSTRUCTOR 10-15 MINUTES

PRACTICE EXERCISE IN SKILLS WITH SLIGHT VARIATIONS 30 MINUTES

REVIEW CONCEPTS | HOMEWORK 10-20 MINUTES @11:30 AM

The Github logo, consisting of the word "Github" in white text on a dark grey rectangular background.

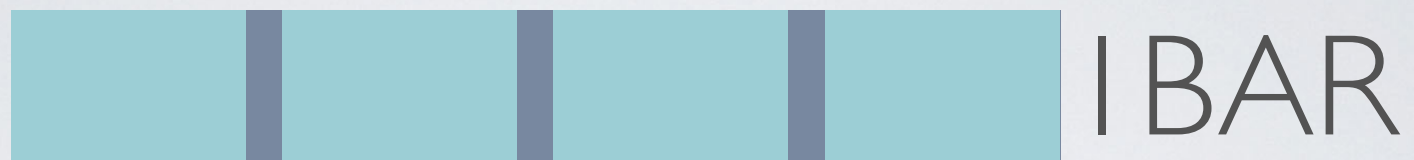
[https://github.com/junior-devleague/GameProductionProgram/tree/master/
GameMusicComposition/Week3](https://github.com/junior-devleague/GameProductionProgram/tree/master/GameMusicComposition/Week3)

<http://ciocan.github.io/angular-wheel-rhythm/>

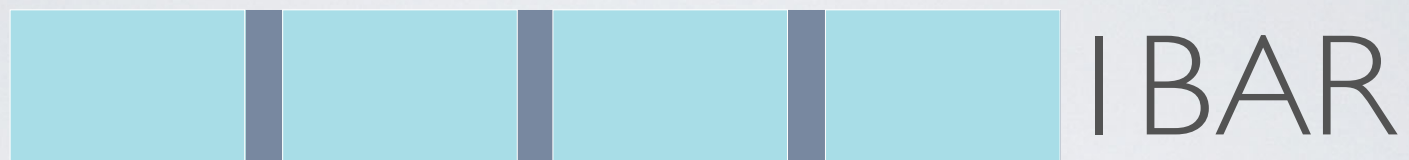
REVIEW



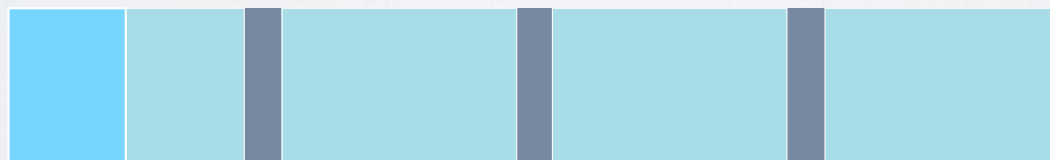
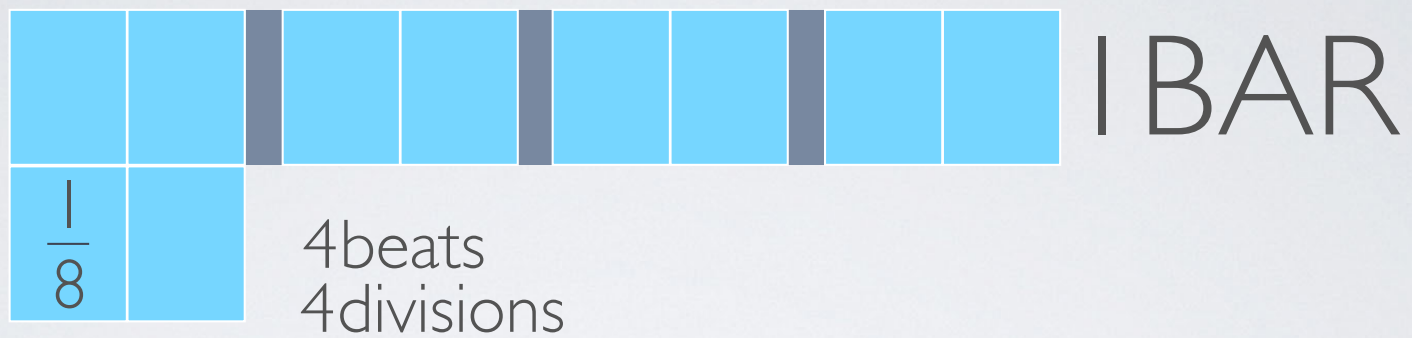
I BAR

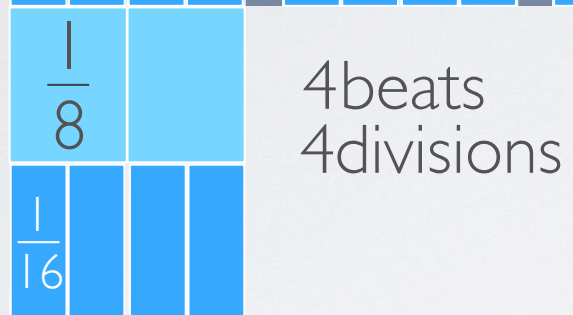


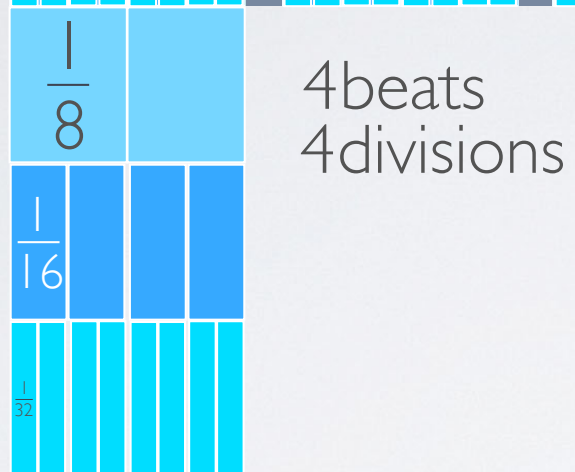
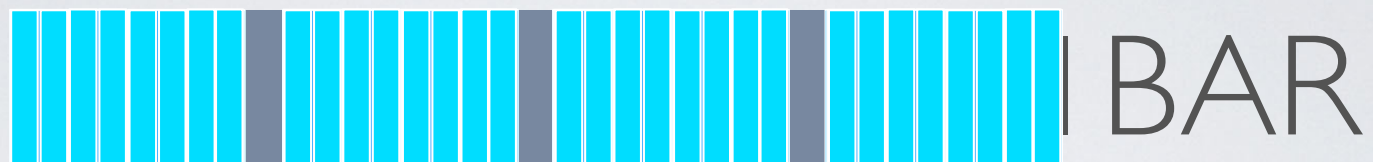
4divisions

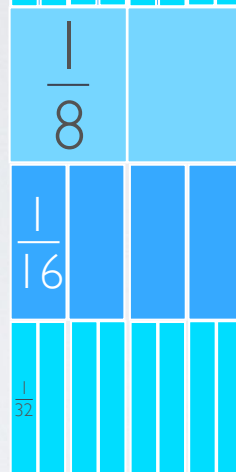
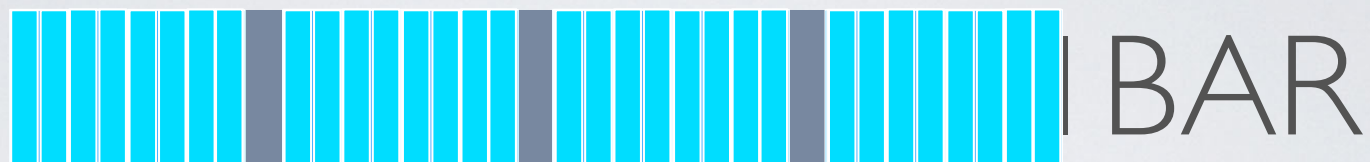


4beats
4divisions



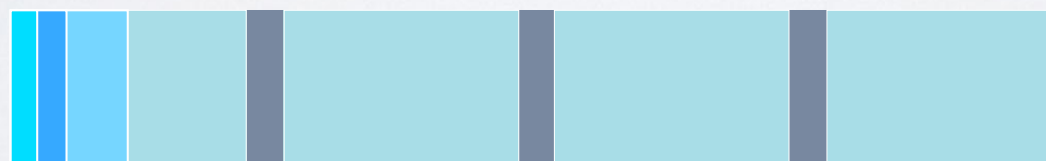




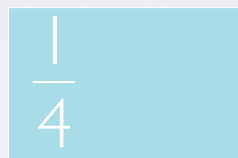
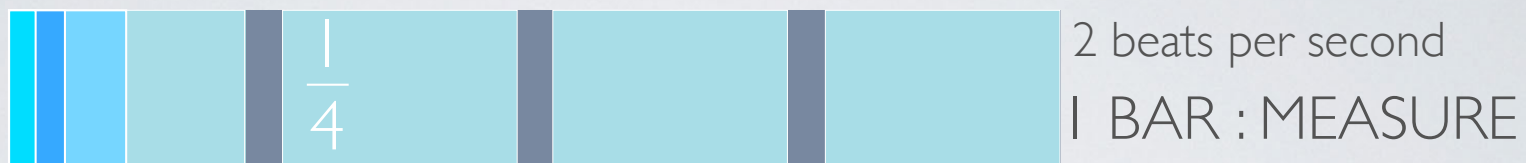


4beats Tempo bpm : heart rate
 4divisions | 20 beats : | 20 quarter notes
 per minute

$$\frac{120 \text{ beats}}{60 \text{ seconds}} = \frac{2 \text{ beats}}{1 \text{ seconds}}$$



2 beats per second
 1 beats per 0.5 second
 1 qtr. note per 0.5second

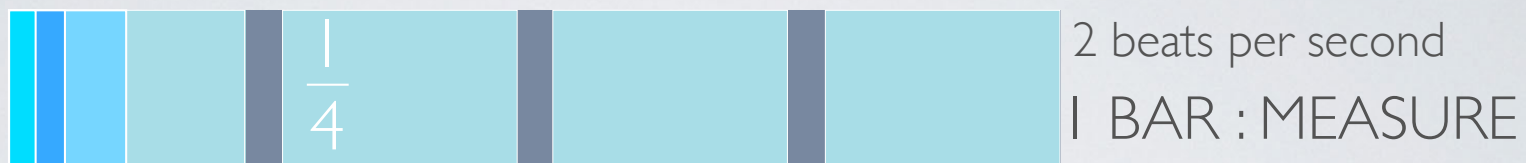


play: c4, release: 0.5

play: c4, release: 0.25

play: c4, release: 0.125

play: c4, release: 0.0625



$\frac{1}{8}$

use_bpm 120

$\frac{1}{16}$

play: c4

$\frac{1}{4}$

$\frac{1}{8}$

play: c4, release: 0.5

$\frac{1}{32}$

$\frac{1}{16}$

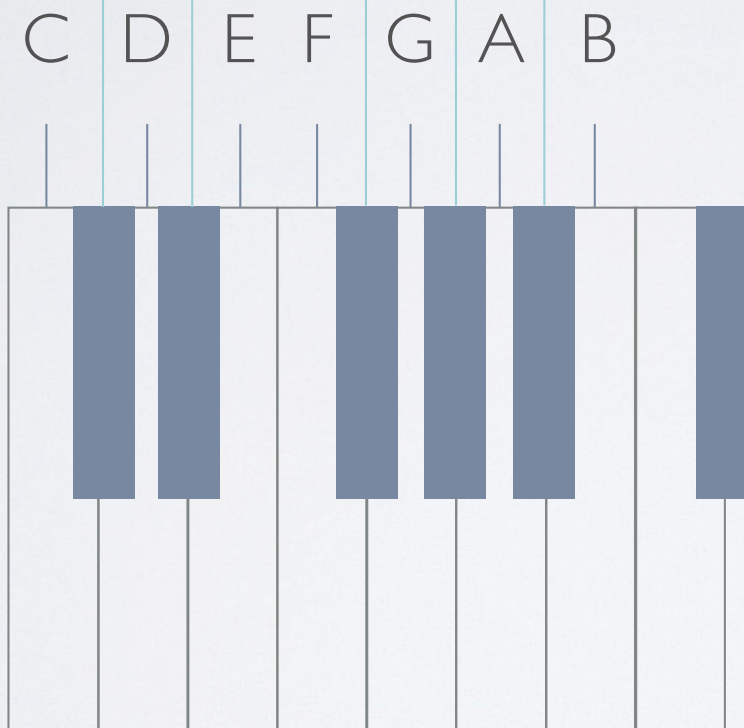
play: c4, release: 0.25

$\frac{1}{32}$

play: c4, release: 0.125

Octave

12 pitches



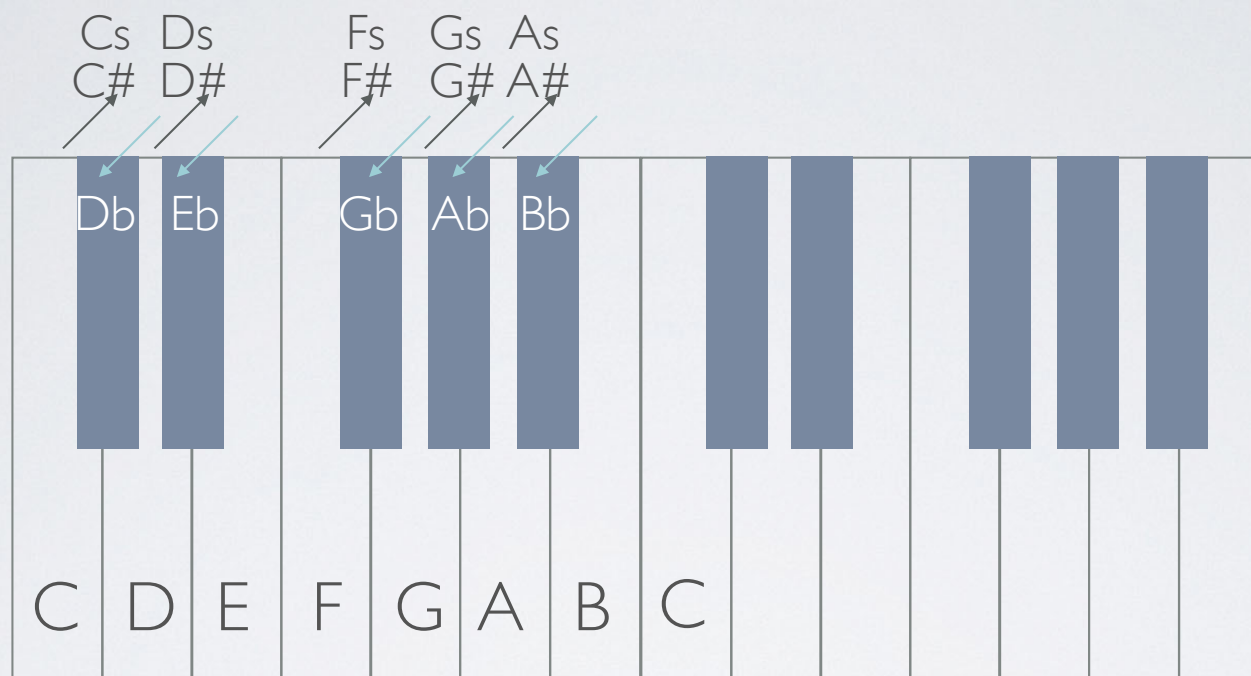
Basic MIDI Chart

These are the numbers translated in Sonic PI when you type pitches

HARMONY

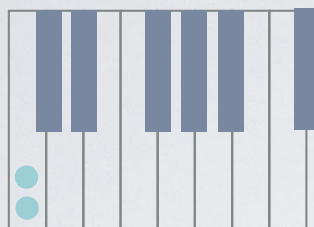
AN INTERVAL IS...

- An interval is the difference of (at minimal) two pitches.

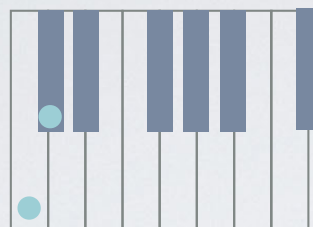


Semitones | half steps

Identify a whole step



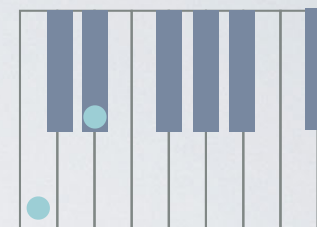
prime/unison



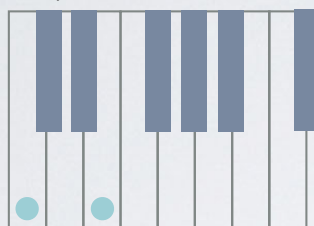
minor second



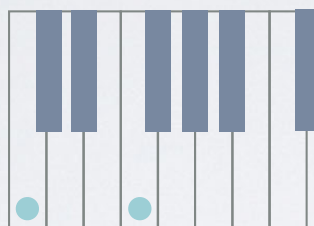
major second



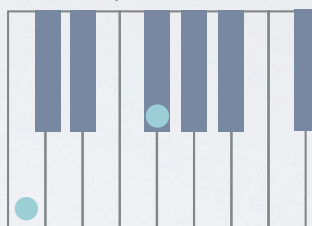
minor third



major third



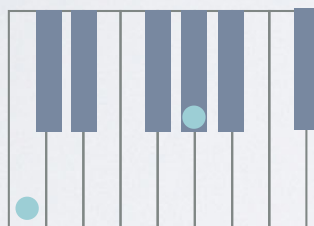
perfect fourth



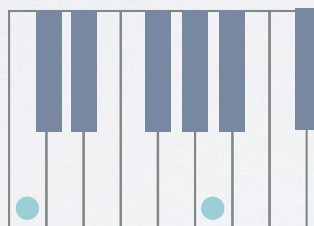
augmented fourth



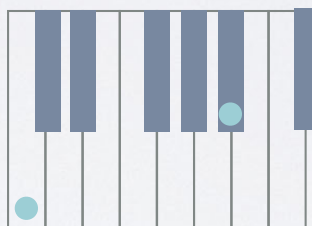
perfect fifth



minor sixth



major sixth



minor seventh



major seventh



octave

13 interval harmonies in the octave via C note
Exercise| Translate this to sequence steps
<http://onlinesequencer.net/>

3 intervals | Programming Functions

Now let's learn to name your blocks so that there is no need to retype the two notes.

```
1  ##| unison/prime
2  play :C4
3  play :C4
4  sleep 1
```

- Must remove “:”
- Convert the notes to MIDI numbers
- Name the musical block in “lowercase”

```
1  define :unison do
2    play 60
3    play 60
4    sleep 1
5  end
```

```
66
67
68  unison
69  min2
70  maj2
71  min3
72  maj3
73  perfect4
74  aug4
75  perfect5
76  min6
77  maj6
78  min7
79  maj7
80  octave
81
82
```

Now you can play each interval with one line

```
1  ##| unison/prime
2  play :C4
3  play :C4
4  sleep 1
5  ##| minor second/m2
6  play :C4
7  play :Cs4
8  sleep 1
9  ##| major second /M2
10 play :C4
11 play :D4
12 sleep 1
13 ##| minor third /m3
14 play :C4
15 play :Ds4
16 sleep 1
17 ##| major third/ M3
18 play :C4
19 play :E4
20 sleep 1
21 ##| perfect fourth /P4
22 play :C4
23 play :F4
24 sleep 1
25 ##| augmented fourth/ A4 (interval)
26 play :C4
27 play :Fs4
28 sleep 1
29 ##| perfect fifth
30 play :C4
31 play :G4
32 sleep 1
33 ##| minor sixth / m6
34 play :C4
35 play :Gs4
36 sleep 1
37 ##| Major sixth / M6
38 play :C4
39 play :A4
40 sleep 1
41 ##| minor seventh / m7
42 play :C4
43 play :As4
44 sleep 1
45 ##| Major seventh / M7
46 play :C4
47 play :B4
48 sleep 1
49 ##| Octave
50 play :C4
51 play :C5
52 sleep 1
```


Let's randomize the 13 intervals

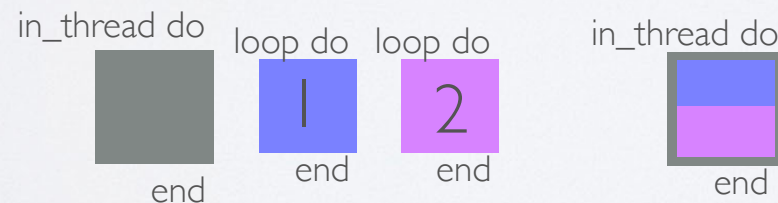
The interval functions [unison, min2, maj2, min3, maj3, perfect4, aug4, perfect5, min6, maj6, min7, maj7, octave] is not recognised as symbols 'c4' or MIDI notes 60

Therefore, the array will not work with names above in a list.

So how do we randomize the 13 intervals in short code?

We will use the concept of **Thread** and the function 'rand.'

Thread will sync two code blocks at a time.



As long as 'sleep' for code block 1=2, it won't fall out of sync

function 'rrand'

rrand(minimal value, maximum value)

13 intervals consist of the pairing of C4 to each note of C4 scale + C5

What is the range in MIDI notes? 60 to 72

How do you randomize the 13 intervals?

```
1  in_thread do
2    use_synth :piano
3    loop do
4      play rrand_i(60, 72)
5      sleep 0.5
6    end
7  end
8
9  loop do
10    play 60
11    sleep 0.5
12  end
```

Exercise | Sequence|Code in SonicPi

1. Unison

2. Octave

3. Perfect fifth

4. Perfect fourth

5. Major third

6. Minor sixth

7. Minor third

8. Major sixth

1. Major second

mild dissonance

2. Minor seventh

3. Minor second

severe dissonance

4. Major Seventh

5. Augmented fourth

Perfect to imperfect consonance

Exercise | Sequence|Code in SonicPi

1. Unison

2. Octave

3. Perfect fifth

4. Perfect fourth

5. Major third

6. Minor sixth

7. Minor third

8. Major sixth

1. Major second

mild dissonance

2. Minor seventh

3. Minor second

severe dissonance

4. Major Seventh

5. Augmented fourth

Perfect to imperfect consonance

Exercise | Sequence|Code in SonicPi

- | | |
|--------------------|---------------------------------------|
| 1. Prime or unison | 7. Minor third |
| 2. Octave | 8. Major sixth |
| 3. Perfect fifth | 9. Major second |
| 4. Perfect fourth | 10. Minor seventh |
| 5. Major third | 11. Minor second |
| 6. Minor sixth | 12. Major seventh |
| | 13. Augmented fourth/diminished fifth |

Graduated spectrum of consonant to dissonant intervals

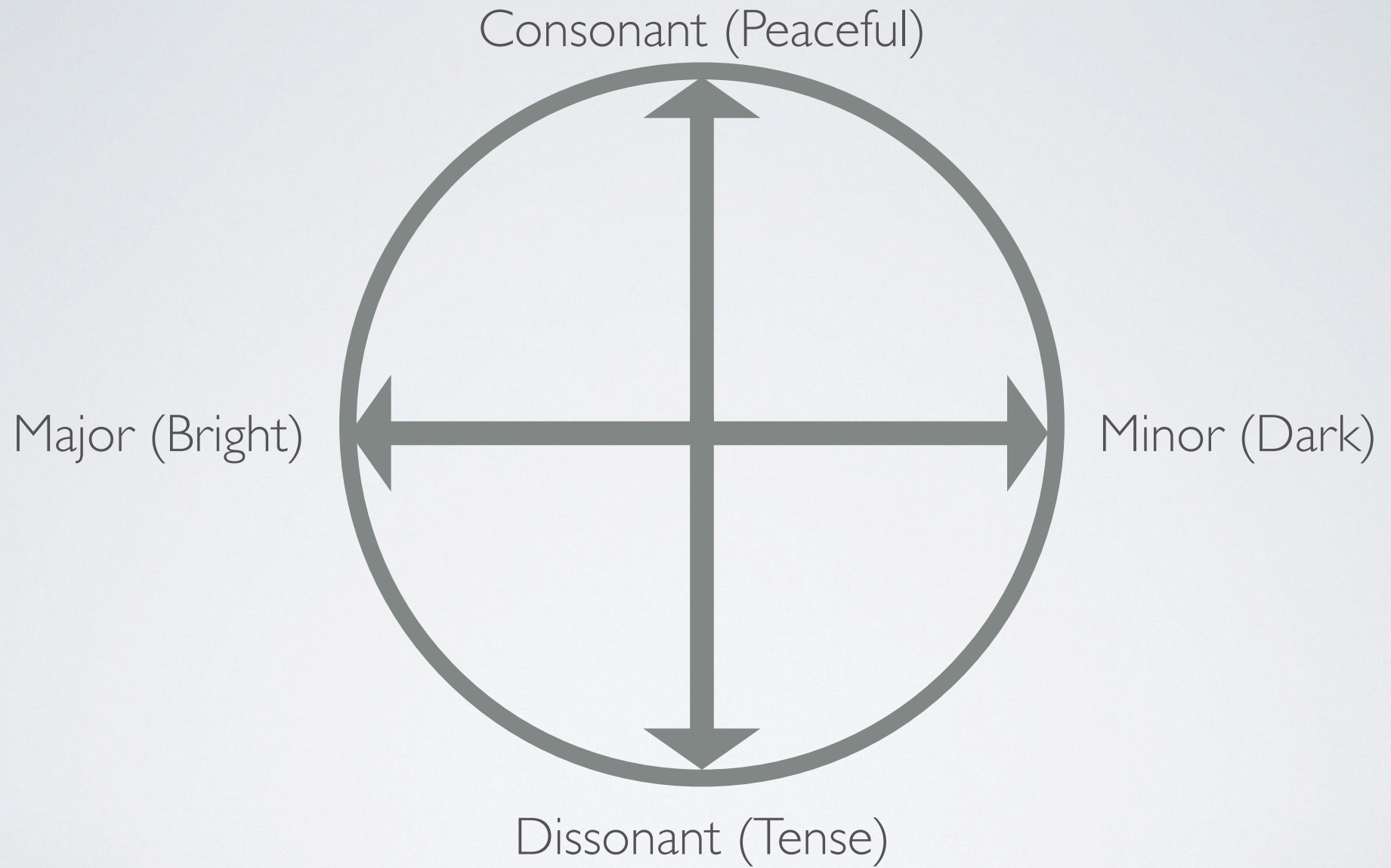


Table 2.1 Perceived Correlation between Emotions and Interval Harmonies

Interval	Notes	Emotion
Unison	C/C	Pleasing, peace
Octave	C/C	Pleasing, peace
Perfect fifth	C/G	Joy, triumph, courage
Perfect fourth	C/F	Excitement, contentment
Major third	C/E	Harmony, peace, joy
Minor sixth	C/Ab	Harshness, meanness, confusion
Minor third	C/Eb	Sadness, sorrow, annoyance, gloominess
Major sixth	C/A	Sweet, enjoyable, pleasing
Major second	C/D	Sadness, strangeness, tension
Minor seventh	C/Bb	Sadness, dismay, sorrow
Minor second	C/Db	Harshness, sinister, confusion, shock
Major seventh	C/B	Surprise, suspicion
Augmented fourth	C/F#	Suspense, shock, sorrow

Alex Carlin, Music Producer

The Interval. Harmony for Computer Musicians

We focused on
C major scale.
Here are the variations

(scale :C, :diatonic)	(scale :C, :octatonic)
(scale :C, :ionian)	(scale :C, :messiaen1)
(scale :C, :major)	(scale :C, :messiaen2)
(scale :C, :dorian)	(scale :C, :messiaen3)
(scale :C, :phrygian)	(scale :C, :messiaen4)
(scale :C, :lydian)	(scale :C, :messiaen5)
(scale :C, :mixolydian)	(scale :C, :messiaen6)
(scale :C, :aeolian)	(scale :C, :messiaen7)
(scale :C, :minor)	(scale :C, :super_locrian)
(scale :C, :locrian)	(scale :C, :hirajoshi)
(scale :C, :hex_major6)	(scale :C, :kumoi)
(scale :C, :hex_dorian)	(scale :C, :neapolitan_major)
(scale :C, :hex_phrygian)	(scale :C, :bartok)
(scale :C, :hex_major7)	(scale :C, :bhairav)
(scale :C, :hex_sus)	(scale :C, :locrian_major)
(scale :C, :hex_aeolian)	(scale :C, :ahirbhairav)
(scale :C, :minor_pentatonic)	(scale :C, :enigmatic)
(scale :C, :yu)	(scale :C, :neapolitan_minor)
(scale :C, :major_pentatonic)	(scale :C, :pelog)
(scale :C, :gong)	(scale :C, :augmented2)
(scale :C, :egyptian)	(scale :C, :scriabin)
(scale :C, :shang)	(scale :C, :harmonic_major)
(scale :C, :jiao)	(scale :C, :melodic_minor_desc)
(scale :C, :zhi)	(scale :C, :romanian_minor)
(scale :C, :ritusen)	(scale :C, :hindu)
(scale :C, :whole_tone)	(scale :C, :iwato)
(scale :C, :whole)	(scale :C, :melodic_minor)
(scale :C, :chromatic)	(scale :C, :diminished2)
(scale :C, :harmonic_minor)	(scale :C, :marva)
(scale :C, :melodic_minor_asc)	(scale :C, :melodic_major)
(scale :C, :hungarian_minor)	(scale :C, :indian)
(scale :C, :leading_whole)	(scale :C, :spanish)
(scale :C, :augmented)	(scale :C, :prometheus)
(scale :C, :purvi)	(scale :C, :diminished)
(scale :C, :chinese)	(scale :C, :todi)
(scale :C, :lydian_minor)	

HOMEWORK

- What will you compose for the game?
- Practice defining functions. In what situation would you define your “musical code block”?
- Use Table 2.1 on slide 27 to create some melodies. Mix it up with single notes and triads.
 - Use `Thread` concept.
 - Use `rrand` fn.

CHALLENGE

How do you play the I 3 interval randomisation code in different C scale on slide 28?

```
1  in_thread do
2    use_synth :piano
3    loop do
4      play rrand_i(60, 72)
5      sleep 0.5
6    end
7  end
8
9  loop do
10   play 60
11   sleep 0.5
12 end
```

Communicate with your fellow Game Music Composers. ^_^

@aisis or email: aisis@devleague.com

Links to codes

<https://github.com/junior-devleague/GameProductionProgram/tree/master/GameMusicComposition/Week3/Aisis>