Making music with Python

Organised sound

- Music is basically ‘organised sound’
- A sequencer is a common way to organise sound:
  - https://www.youtube.com/watch?v=3tCctbRcaos

A python sequencer

- We'll build a simple sequencer in Python!

Starting out

- Download & follow the installation instructions:

https://bit.ly/2P9aFLq

Git repository

- https://github.com/ruben-yacht/PythonSequencer

- It's a bit large (140 MB) because I included some sound samples to start with

- **We'll write our code in** `coding-music.py`

- `Sequencer.py` **can play a user-provided pattern**

- `RepeatedTimer.py` **handles timing**

- `SoundFile.py` **reads & plays sounds via simple audio**

Playing a sound

hello-world.py:

```
from SoundFile import SoundFile
from Sequencer import Sequencer

if __name__ == "__main__":
    sound = SoundFile("hello-world.wav")
    seq = Sequencer(sound,[1], 110)
    seq.play(3)
```

CTRL+C to quit program.

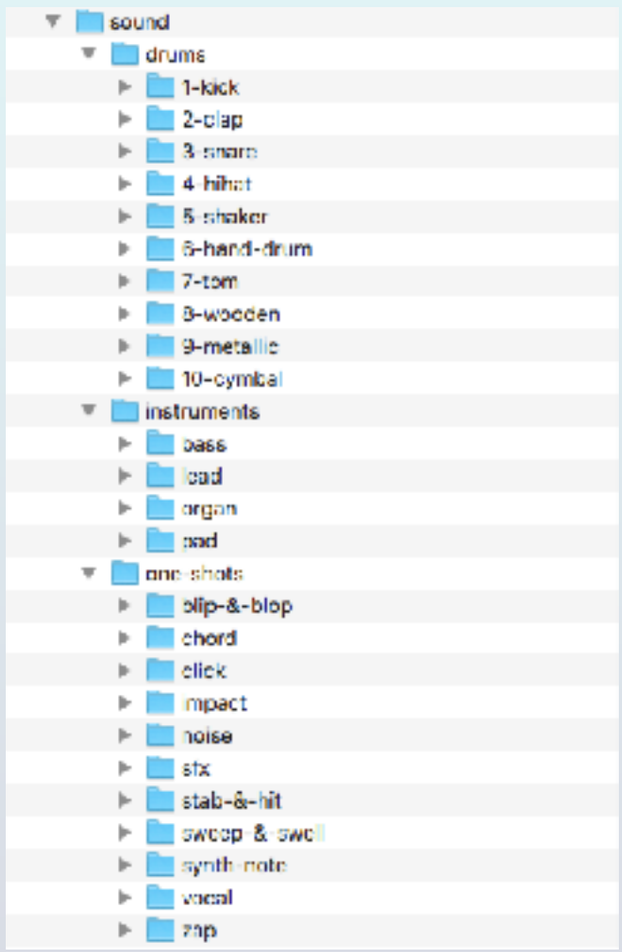
Making a beat

example-basic-drumbeat.py:

```
from SoundFile import SoundFile
from Sequencer import Sequencer

if __name__ == "__main__":
    x = 1
    o = 0

    sf1 = SoundFile("../sound/drums/1-kick/kick-allaboutyou-1.wav")
    sq1 = Sequencer(sf1,[x,o,o,o,x,o,o,o])
    sq1.play(10)

    sf2 = SoundFile("../sound/drums/4-hihat/closedhh-allaboutyou.wav")
    sq2 = Sequencer(sf2,[x,o,x,o,x,o,x,o])

    sq2.play(10)

    sf3 = SoundFile("../sound/drums/3-snare/snare-allaboutyou.wav")
    sq3 = Sequencer(sf3,[o,o,o,o,x,o,o,o])
    sq3.play(10)
```

Exercise 1: simple beat

- Explore the sounds
- Make a selection of 3-5 sounds to use
- Copy/note their paths
- Program a simple beat in `coding-music.py`



Exercise 2: algorithmic beats

coding-music.py *(add below earlier code)*

```
sf2 = SoundFile("../sound/drums/2-clap/clap-allaboutyou.wav")

    notes = []

    for n in range(0,4):

        if(random.random() > 0.5):

            notes.append(x)

        else:

            notes.append(o)

sq2 = Sequencer(sf2, notes, 90)

sq2.play(3)
```

Tip: adjusting volumes

eaudio unfortunately doesn't let us change volumes or add effects.

nload & install Audacity

ttps://www.audacityteam.org/download/

Nice Mac alternative: TwistedWave

n a sound from your previous polyrhythmic beat

read the files directly from the original'

elect the file

ffect > amplify > [choose louder or softer] > ok

ave

ack to your IDE and check if the volume sound of the beat changed.

Tip: Polyrhythms

- A sequencer repeats the pattern after the list is finished; so it doesn't have a fixed length like in the video! Try:

```
from SoundFile import SoundFile
from Sequencer import Sequencer

if __name__ == "__main__":
    x = 1
o = 0

sf1 = SoundFile("../sound/drums/1-kick/kick-allaboutyou-1.wav")
sq1 = Sequencer(sf1,[x,o,o])
sq1.play(10)

sf2 = SoundFile("../sound/drums/4-hihat/closedhh-allaboutyou.wav")
sq2 = Sequencer(sf2,[x,o,x,o])

sq2.play(10)

sf3 = SoundFile("../sound/drums/3-snare/snare-allaboutyou.wav")
sq3 = Sequencer(sf3,[o,o,o,o,x,])
sq3.play(10)
```