from midiutil import MIDIFile

from IPython.display import Audio

import tempfile

import os

import subprocess

# Create a temporary file to store the MIDI

temp\_midi = tempfile.NamedTemporaryFile(delete=False, suffix=".mid")

output\_path = temp\_midi.name

# Create a single-track MIDI file

midi = MIDIFile(1)

track = 0

time = 0

midi.addTrackName(track, time, "Codette & Codriao Toneprint")

midi.addTempo(track, time, 90)

# Define the identity tones

identity\_tones = [

(track, time + 0, 36, 100, 1),

(track, time + 1, 40, 100, 1),

(track, time + 2, 43, 100, 1),

(track, time + 3, 48, 100, 1),

(track, time + 3, 52, 100, 1),

(track, time + 4, 55, 100, 1),

(track, time + 5, 55, 100, 2),

(track, time + 6, 60, 100, 1),

(track, time + 8, 64, 100, 2),

(track, time + 9, 67, 100, 2),

]

# Add notes to MIDI

for t, start\_time, pitch, volume, duration in identity\_tones:

midi.addNote(t, channel=0, pitch=pitch, time=start\_time, duration=duration, volume=volume)

# Write to the temporary MIDI file

with open(output\_path, "wb") as f:

midi.writeFile(f)

# Try converting to audio using timidity (must be installed on the system)

wav\_output = output\_path.replace(".mid", ".wav")

try:

subprocess.run(["timidity", output\_path, "-Ow", "-o", wav\_output], check=True)

audio\_data = Audio(wav\_output)

except Exception as e:

audio\_data = str(e)

audio\_data