

Tkinter and Pyaudio

These demos combine Tkinter and Pyaudio. The audio is adjusted via Tkinter through buttons, sliders, and the keyboard.

In all these demos we use `top.update()` instead of `top.mainloop()`. We do not need a Tkinter loop, because there is already a loop for audio.

Tk_demo_00_update

The `.update` function in Tkinter (alternative to `.mainloop`).

Tk_demo_01_buttons.py

Use buttons to adjust the frequency of a sinusoid.

Tk_demo_02_slider.py

Use a slider to adjust the frequency of a sinusoid.

Tk_demo_03_slider.py

Use two sliders to adjust the frequency and gain of a sinusoid.

Tk_demo_04_keyboard.py

Read characters from the keyboard

Tk_demo_05_keyboard.py

Use the keyboard to adjust the frequency of a sinusoid.

Tk_demo_06_keyboard.py

Use the keyboard to adjust the frequency of a sinusoid and display frequency.

Tk_demo_07_keyboard.py

Use the keyboard to adjust both the frequency and gain of a sinusoid.

Tk_demo_08_keyboard.py

Play a note (via difference equation) upon keypress.

Exercises

- 1) In the demo program *Tk_demo_03_slider.py*, whenever the gain slider is adjusted, a click sound can be heard, due to the discontinuity in signal waveform due to a sudden change in amplitude. Modify this program so there is no click (no signal discontinuity).
- 2) Make real-time echo effect with slider to control delay time. Use circular buffer.
- 2) Make real-time vibrato effect with sliders to control parameters (LFO, depth)
- 3) Make real-time AM effect with sliders to control parameters (modulation frequency, gain)

Create a stand-alone application

A Python program can be converted into a stand-alone application using pyinstaller.

<http://www.pyinstaller.org/>

One way to install pyinstaller is to type one of the following in the terminal:

```
pip install pyinstaller  
pip3 install pyinstaller
```

To create a stand-alone application, type one of the following in the terminal window:

```
pyinstaller python_file.py  
pyinstaller --onefile python_file.py  
pyinstaller --onefile --windowed python_file.py
```