COS/MUS 314

Drum Machine 3

Assignment due 3 March 2008

0. **Reading**

    a. Concurrency in ChucK

        http://chuck.cs.princeton.edu/doc/language/spork.html

    b. Events

        http://chuck.cs.princeton.edu/doc/language/event.html

    c. Command line arguments

        http://chuck.cs.princeton.edu/doc/examples/basic/args.ck

    d. OSC

        see section in Events documentation above
        run OSC examples at http://chuck.cs.princeton.edu/doc/examples/
        (more info in the ChucK manual)

1. Event-based synchronization of drum machine
Store all code for this question in one directory.

Modify your drum machine to use event-based synchronization instead of the on-the-fly synchronization that you've been using. For example, you might have a "time-keeper" shred that broadcasts an event every beat (or sub-beat). Or you might have some other solution.

2. OSC communication
Copy your solution for question 1 into a new directory. Instead of broadcasting events, use OSC messages to communicate between (and synchronize) shreds.

Comment on the pros and cons of using on-the-fly, event-based, and OSC-based synchronization.

3. Simple melody function
In a new ChucK file, write a new function, playMelody, which accepts two parameters: an array containing the melody notes, and an array specifying their rhythm. The function should play the specified melody using a UGen (e.g., Phasor) with global scope.

4. Smoothing the melody
In the same ChucK file from Question 3, create a global Envelope object, env, and a function, smoothMelody, which continually updates the frequency of your UGen used above to the value of env. Spork this function to run continuously in the background. Change your playMelody function to update the target of the envelope instead of updating the raw frequency of the UGen. Play with setting env.duration to different values.

Listen to the sound with and without the envelope. Why might it be a good idea to use an envelope to change pitch, loudness, or other parameters gradually, instead of resetting them instantaneously?

5. Synchronized melody
Finally, integrate your melody code into your synchronized drum machine framework.

What to hand in:

- A nicely packaged (e.g. gzipped) set of everything in your directory for Question 1.
- A nicely packaged set of your full, event-based, enveloped-smoothed melody drum machine (code for questions 2-5).
- Answers to written questions in 2 and 4.

Be ready to demo your favorite drum machine manifestation in class.