

ITEC 120 Lab 7

Created by Dr. Ray

Reference links:

<http://www.radford.edu/~aaray/template.java>

<http://www.radford.edu/~aaray/FunctionContainer.java>

<http://www.radford.edu/~aaray/Sound.java>

You will need to turn in a lab report for this lab.

Problem 1: Create an interactive keyboard

8bit Entertainment LLC has hired you to create an interactive keyboard that can be used to play simple songs using 8bit style notes.

Part 1: Play a single note

Create an A4 note (440hz) that lasts for one second and play it. Choose a square, triangle, or sine wave for creating the note.

Steps involved:

1. Create a sound with sampling rate 22050.
2. Use the `Sound.getFreq("NoteName")` function to get the frequency for a specific note.
3. Go through each sample in the created sound and set its value to be what is expected in the sound wave that represents the note.
4. Call the `blockingPlay` method on the sound.

Part 2: Create several notes

Create the notes C4, D4, E4, F4, G4, A4, and B4 (using a half second duration this time) using both square and sine waves.

Part 3: Create a keyboard simulator

Create a command line simulator that accepts the following commands:

switch

c

d

e

f

g

a

b

quit (halts the keyboard simulator).

By default, the square notes are used. However, when the switch command is entered, the type of notes is switched from square to sine or vice versa.

Whenever a note is entered into the simulator, play it using the notes created in part2. Use the following sheet music to help test your keyboard:

<http://www.music-for-music-teachers.com/images/mary-had-a-little-lamb-no-keyboard.gif>

You can find other songs to test your keyboard with the following URL (though you may need to expand what notes your keyboard program can play to play them):

<http://www.music-for-music-teachers.com/beginner-piano-music.html>

Problem 2: Wav files

Beyond just a keyboard simulator, you are contracted to build a simple wav file player and modifier. This will allow for artists to re-use earlier work.

Part 1: Play a wav file

Find a wav file online, or record one yourself. Write the java code necessary to play the file. See the lecture slides for an example of how to do this.

Part 2: Add effects to the wav file

Pick two of the effects from the second sound lecture and implement them in your program. Play the additional effects in addition to the original sound.