

# MUS 470 Lab Assignment 1

Fall 2022

**Due date: Wednesday, Sep.7**

1. Write an audio generator plugin which creates an audio stream which is a *parabolic sine wave*, see below.
2. The plugin should have a variable frequency parameter which can be changed through the plugin interface.
3. Sample rate and default normalization can be handled as you wish.
4. Capture some output of your plugin and save as a wav file, then open with Audacity and use spectrum plot to see the spectrum. What do you notice?

The parabolic sine wave is simply a wave form with a chosen period and frequency which consists of an inverted parabola on its first half period, and a translated and reflected version of this parabola on its second half period. For example, if the period length is 4, then the parabola could take the form:

$$y = 1 - (t - 1)^2$$

on the interval  $[0, 2)$ , and

$$y = (t - 3)^2 - 1$$

on the interval  $[2, 4]$ . Note that the curve is continuous and differentiable on the entire interval  $[0, 4]$ , and that the wave form generated from this period extended to all  $t$  is also continuous and differentiable, but not twice differentiable. This wave form is therefore called  $C^1$  but not  $C^2$ .

Suggestions: Use JUCE to get the plugin working as quickly as possible. First, get the basic plugin tutorial project working, then the sine synth tutorial. You can discuss this lab in class with other students

For credit during lab classes on Wednesday, August 31, and Wednesday September 7, write up a brief description of what you did during the lab on those two days during the last five minutes of the lab session. Turn this into the Lab Assignment box on Moodle by 5pm.