

MUS 471/471L Homework 1

Spring 2019

Due date: Monday, January 21.

1. Write a plugin that can be loaded and run in Logic Pro on a Mac. The plugin can be in any of the common formats.
2. The plugin should be an audio generator which creates an audio stream which is a *parabolic sine wave*, see below.
3. The plugin should have a variable frequency parameter which can be changed through the plugin interface.
4. Sample rate and default normalization can be handled as you wish.

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 .