University of Washington
Department of Electrical Engineering
EE 341, Winter 2017

Report for Lab #2:
Elementary Sound Synthesis

Report by:
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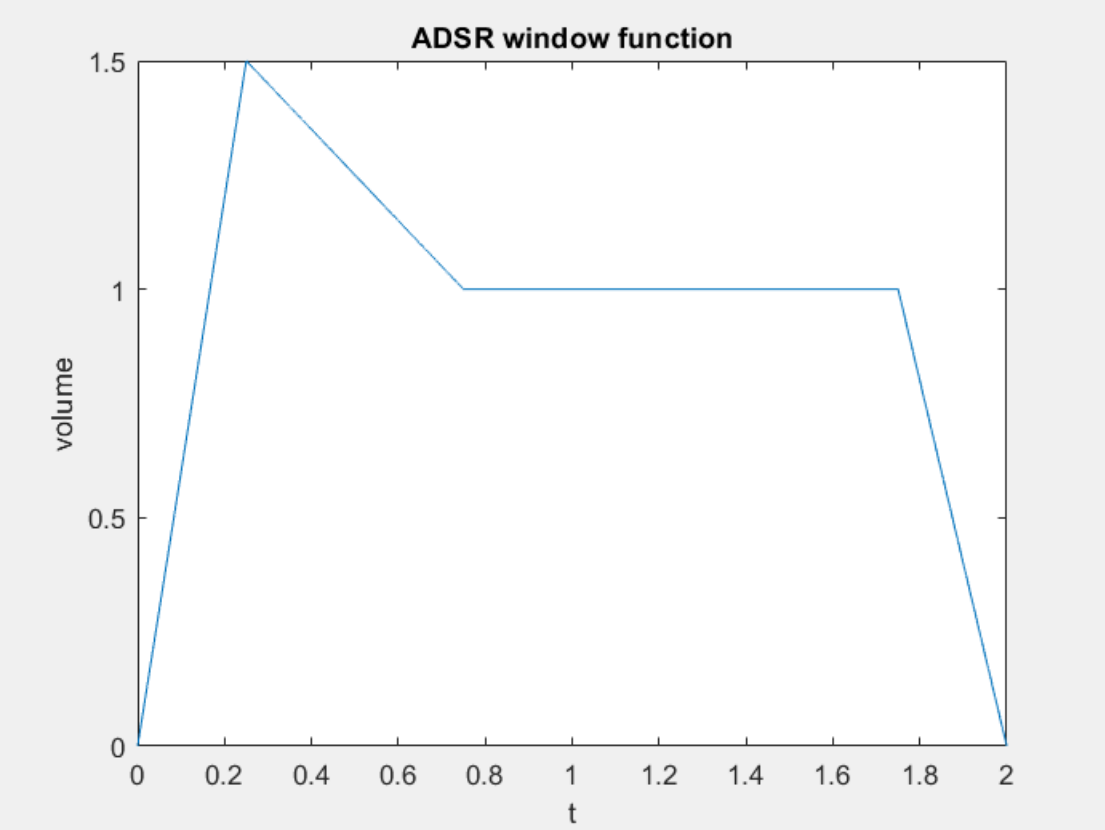
1 GROUP ASSIGNMENT I

Q1: An Equation for the discrete time cosine that corresponds to continuous frequency fc given sampling frequency fs:
A1: x[n] = cos(2pi*(fc/fs)*n)

2 GROUP ASSIGNMENT II

Q2: A plot for the ASDR window function that you designed, an explanation of how it varies with the length of the note (full vs. half vs. quarter, etc.) and the amount of note overlap you used.



The ADSR window function has a length of 2s for a whole note, 1s for half note and 0.5s for quarter note.
The amount of node overlap used is 200 (samples).

3 GROUP ASSIGNMENT III

Q3: the cosine frequency and the decay factor that you used and your observations about the perceptual effect of varying those parameters.
A3: the cosine frequency and decay factor used are 100 and -0.65 respectively. Increasing the cosine frequency makes the result sounds smoother and less rough to hear. Increasing the magnitude of yhe decay factor makes the result sound attenuate faster.

4 GROUP ASSIGNMENT IV

Q4: the time scaling factor(s) you used, and discussion of the perceptual effect of time scaling the signal that you uploaded.
A4: scaling factor = 1/8. The time-scaled signal sounds deeper.
A3: the cosine frequency and decay factor used are 100 and -0.65 respectively. Increasing the cosine frequency makes the result sounds smoother and less rough to hear. Increasing the magnitude of yhe decay factor makes the result sound attenuate faster.

5 INDIVIDUAL ASSIGNMENT I

Q4: An image of the score of your song snippet.

(For this assignment, I wrote a function (songSynth) that reads from a txt and generate corresponding .wav file. Since Canvas doesn't accept a .txt file, the content of my 'twinkle.txt' is:

"CCGGHHG*FFEEDDC*GGFFEED*GGFFEED*CCGGHHG*FFEEDDC"

Where a single character represents quarter note and a * character represents a corresponding a corresponding half note. Also, H is used to represent A of a higher octave).

6 INDIVIDUAL ASSIGNMENT II

Q6: A short description of the original sound, the source of the sound, and what time scaling factor you used.

A6: The original sound is the 'twinkle twinkle little star' generated in the previous assignment. I used a scale factor of 4.