
DSP First
Mini-Project 01: Jingle Bells Synthesizer

Background:

For this mini project you will write a simple MATLAB program that synthesizes music with sinusoids. Starting with sheet music for Jingle Bells, you will learn how to map each note on the staff to its frequency and duration and then have MATLAB generate a sinusoid for that note. Adding up all the sinusoids will generate a wave that when played through speakers will sound like Jingle Bells. You will then save this file as a **wav** (or mp3) file and email it to me.

Approach

You will need to look at two places to learn how to do this mini project. The first will give you some hints on how to do the project; the second will give you the sheet music for Jingle Bells.

1. Open the CD-ROM from SP First. In the menu tree on the left, expand chapter 3. Expand **Labs**, and click on **Lab04**. You do not have to do this lab, however it has many good ideas on how to do this mini project. Take a look at it.
2. A quick search for "Jingle Bells Sheet Music" on Google found several hits. You are free to find your own sheet music. Here are some that will work:

http://www.pitt.edu/~deben/0JingleB.pdf	Nice and simple. Minimum needed for this mini project.
http://www.music-scores.com/christmas/composer.php	Adds a base line. A good start for those who want full credit.
http://www.8notes.com/scores/1523.asp?ftype=midi	Two voice melody and base line. For the over-achievers in the class.
http://www.lorieline.com/music_download/pdf_files/jingle_bells.pdf	

This is a fun mini project. Start early so you have time to ask questions if needed. Once you have something working, create a **wav** file using MATLAB's **wavwrite** command. Note: For those who want to do more, **wavwrite** can write stereo files. **wavwrite** expects the input vector to have values between -1 and 1. You might have to scale your data.

Grading

Getting a few measures working with just sinusoids will get you no more than 7 out of 10 points. If you want more points you will have to be creative. Adding more voices, or using more than sinusoids are creative. Simply synthesizing more measures is not creative.

Well written code may gain a point; ugly code (copy and pasting stuff over and over that should be in a loop for example) will certainly lose points.

Due Date:

For mini project, you may work in groups of one or two (preferably two).

What is due:

1. wav file of your song
2. One page memo describing what you did. Highlight any **extras** you've added.
3. Your MATLAB code.