

I400 Assignment 7 - Apr. 19, 2007

Due Apr. 26, 2007

1) Write a short program that generates a Sun/NeXT .au file of a 1 second sine wave. This amounts to generating the sine wave, with the following header at the front of the file:

Size	Name	Value	Comment
4	magic	0x2e736e64	Magic number = .snd as a integer
4	dataLocation	28	Offset to the data in Bytes
4	dataSize	176200	Number of bytes of data (= 44100 * 2 * 2)
4	dataFormat	3	Pre-defined code for 16-bit linear data
4	samplingRate	44100	Sample rate in Hz
4	channelCount	2	Number of channels (for stereo)
4	metadata	0	metadata information

You can check your answer using the audacity program. As a guide, I have placed Travis Pope's article "A Children's Guide to Sound File Formats" online. See pages 15–19 if you need more information.

2) Please explain, in a short paragraph, the difference between bit rate and sampling rate with regards to sound files and streaming audio. You may use the internet for this question.

3) Find a short piece of stereo audio (at least 30 seconds) in the Wave file format. You can make this with a microphone, or take it from something previously recorded. The assignment is to encode this file in several different formats and answer some questions about each one. Using the free program Audacity (<http://audacity.sourceforge.net/>) to do the conversions. This is also available in the Informatics lab. I want you to prepare your answers in a small table, with the following information for each file:

file type	encoding time	file size
original wav file		
aiff 16 bit		
au format (8-bit u-law)		
ogg-vorbis(qual. 1)		
ogg-vorbis(qual. 5)		
ogg-vorbis(qual. 10)		
FLAC 16 bit		

Please submit the files on a compact disk, along with the table.

4) In your opinion, what are the differences in sound quality between the ogg-vorbis files and the original wave file?

5) In your opinion, what are the differences in sound quality between the au file and the original wave file?

6) In your opinion, what are the differences in sound quality between the FLAC file and the original wave file?

7) In your opinion, what are the differences in sound quality between the FLAC file and the ogg vorbis files?