Audio File Formats

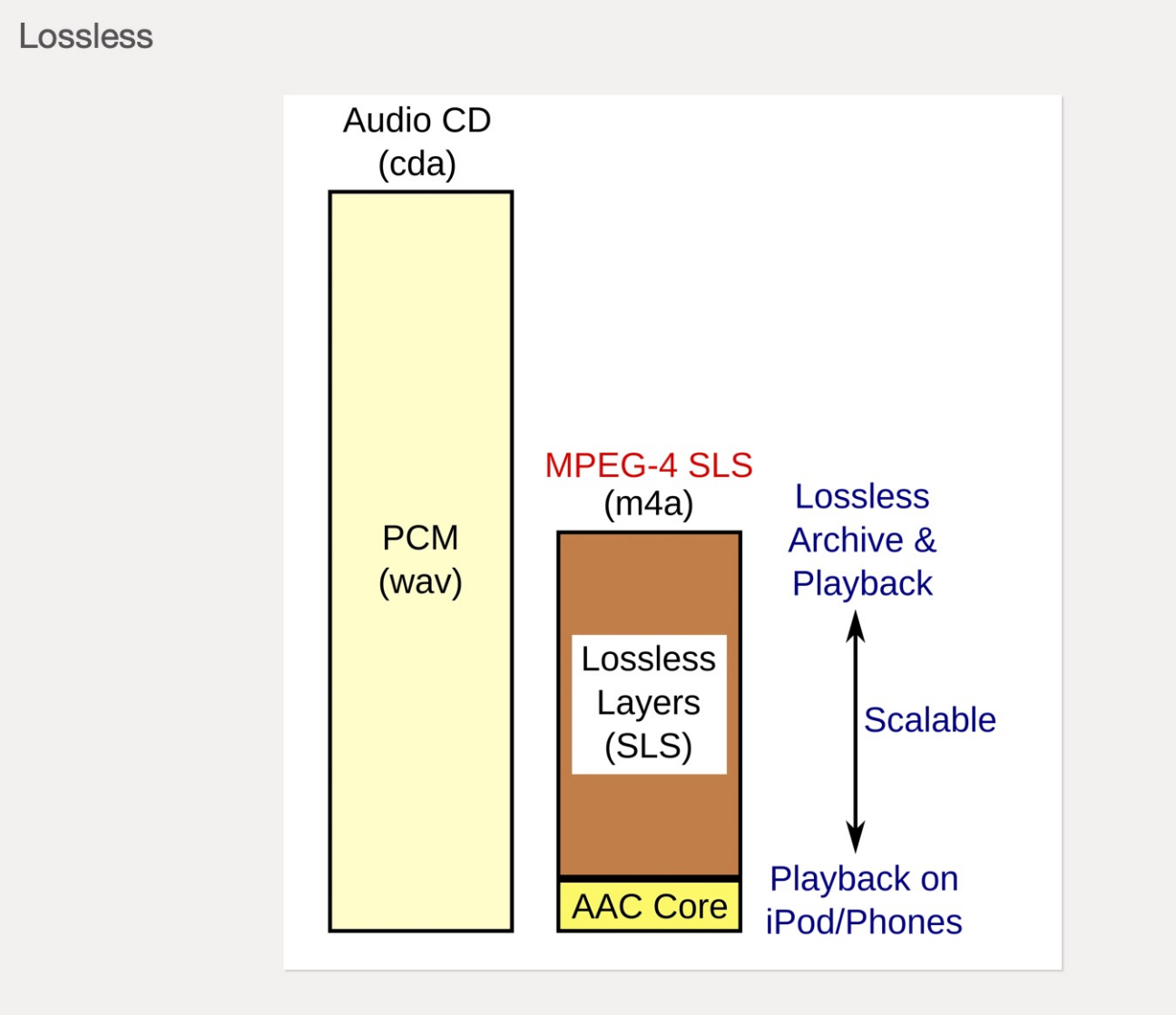
Coms/Film 20A Audio Production

CSUS

Spring 2022

Basics

- **Uncompressed**.
- **Lossless**:
- Compressed.
- Up to 70% smaller.

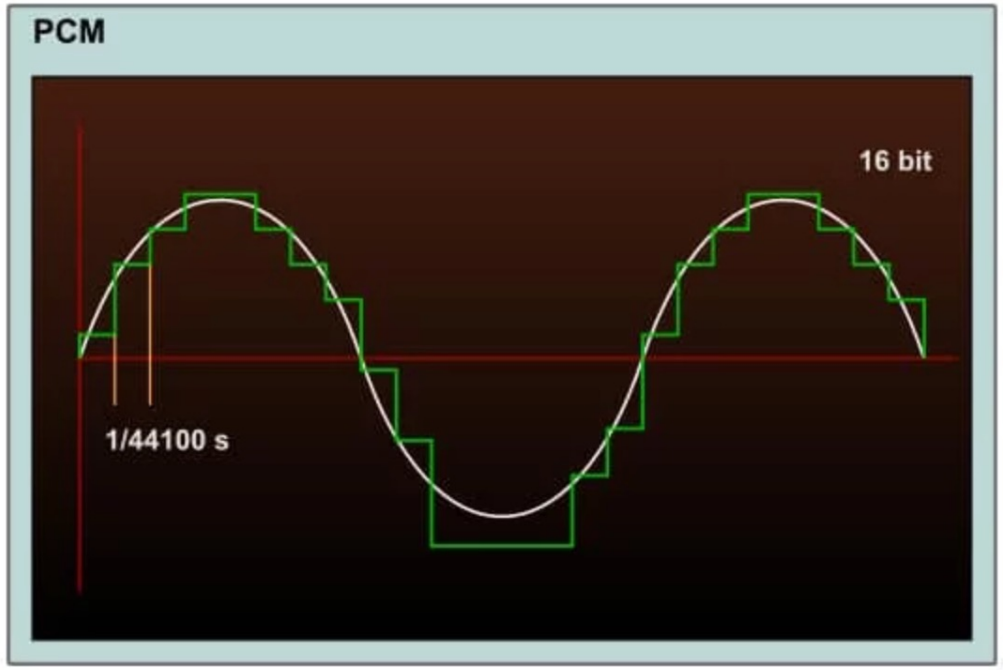


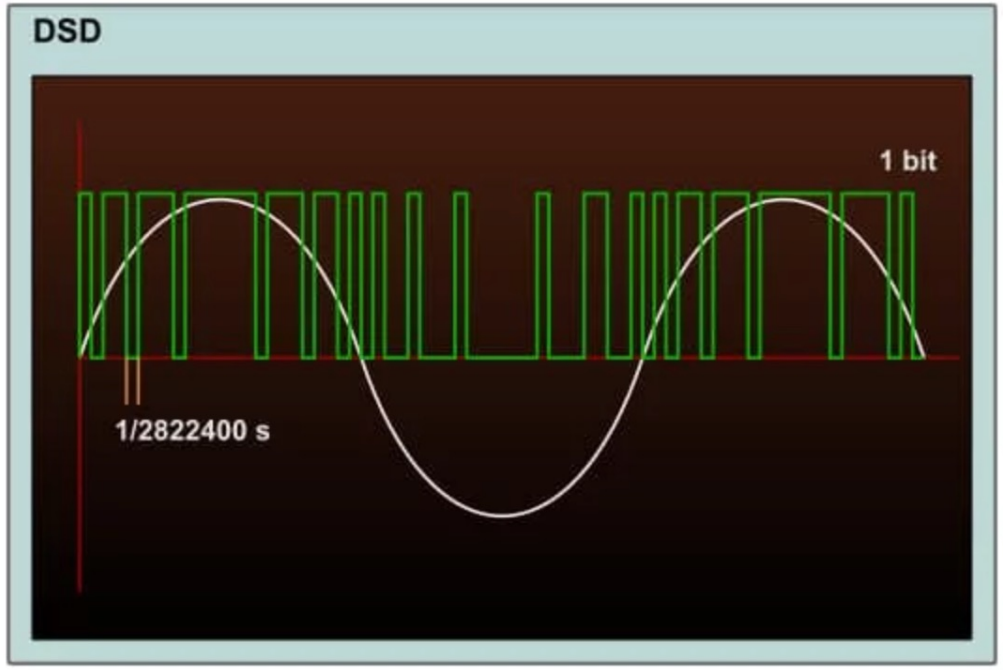
- **Lossy**:
- Compressed.
- Major variations in quality.
- MP3 is an example of lossy quality.
- **PCM**:
- Pluse-Code-Modulation:
- The method that converts audio from analog to digital (sampling rate and bit depth).

10 Major Audio Formats (from least to most popular).

- **DSD**:
- Unique A/D processing.
- Uses only 1-bit while sampling.
- Samples 2.8 million times per second.
- Produces audio at 24 bit & 96 kHz.
- Great sound quality.
- Compressed format.
- Most systems cannot play them.
- An external A/D converter is needed.

DSD





- **Ogg Vorbis**:
- Open-Source format.
- Compressed format.
- Has a wide range of sampling rates.
- Very high quality with a very small file size.
- Need special software player or extension to players to read.
- Is not very popular because of the above issue.
- *Spotify* uses this format is store their files.
- **WMA (Lossless):**
- Shares the same name, *WMA*, as the lossy format.
- Stands for *Windows Media Audio*.
- Compressed format.
- Usually will not playback on a Mac unless you have special extensions on your audio playback software.

- **WMA (Lossy):**
- Windows Media Player.
- Compressed format.
- Higher quality, with comparable file sizes, such as MP3.
- When 1st developed was very popular, but not now.
- Can have problems playing on a Mac.
- **ALAC:**
- *Apple Lossless* audio file format.
- Compressed format.
- Plays on both Apple and Window products.
- Has higher quality with less storage space than *WMA (lossless).*

- **MP3:**
- Extremely popular.
- Extremely versatile.
- Play on just about any electronic device with audio.
- Compressed format.
- It is a lossy format and although high quality, on some devices and for some listeners, the loss of information can be perceived compared to higher quality formats.
- **AAC:**
- Came out right after *MP3*.
- Like *MP3* it is a lossy format.
- Compressed format.
- Is higher quality than MP3.

- Has never been able to supplant *MP3* in spite of it's high quality using the same amount of storage space and being able to be used on most operating systems.
- An analogy would be compare it to what happen in the consumer "video tape wars' between Beta vs. VHS.
- **FLAC:**
- *Free Audio Lossless Codec*.
- It is a compressed format.
- Very high quality with very little storage space.
- Up to 70% less space than formats at comparable quality.
- Although not compatible with *iTunes*, it is with *QuickTime*.
- Compatible with both Windows and Mac machines.

- **AIFF:**
- Sometimes seen as .aif
- Developed by Apple.
- Once upon a time would only playback on Apple products, but now can play back on most operating systems.
- **THIS IS THE AUDIO FORMAT YOU WILL BE USING FOR PROJECT #3.**
- Unlike **all** 8 preceding formats it is **UNCOMPRESSED.**
- This means that the quality is exceptional and can be used professionally for recording and mastering audio.
- The file sizes are larger than the preceding compressed formats.
- The only reason it is not #1 on the list is that the format is less well known.

- **WAV:**
- Like *AIFF*, it is an uncompressed format.
- It plays back on both Windows and Mac systems.
- It is extremely high quality.
- Like *AIFF*, it also has large files sizes.
- It is very popular professionally and is used for both recording and mastering.
- Because of the above it is recognized as *the* professional audio format.
- *BWF*: Is a subtype of WAV. It stands for Broadcast Wave Format.
- It is WAV file with area on the file for metadata;
- Timecode, take number, “roll” number, song title, artist, etc.

Compression

- It can be a very complex subject, but can have a very simple explanation:
- A digital file, audio and/or video, that does not record all the information that is presented to it.
- This will almost always result in some loss of quality, even if it is not precipitable to the human ear or eye.
- For something to be compressed (recorded), “Compression” software is needed.
- For something to be decompressed (played back), “Decompression” software is needed.
- The software is usually written together and called a **CODEC**: Compression and Decompression. Each compressed file type (video/audio) has its own unique **codec**.
- Your play back device must be able to translate that codec and especially for video, there are a very large number of file formats that need their own codec. That codec may need to be download before you can read the file. This is extremely true for high-end video.