Project Problem Statement

Develop an application that demonstrates a sound playing device. When the application runs, it should:

1. Allow the user to select the sound player to be demonstrated.
2. Allow the user to configure that player (different players require different configuration options).
3. Play the fixed set of chosen sounds on the player.
4. Shut down the system when demo has completed.

Your demo application will show off one of two types of sound player: a sound card or a visualizer. At the start of the application, the demo will offer the user the choice of which player to demonstrate.

The application must direct the user to setup the application’s sound player. Per the sound card API, the user must choose a device ID, the number of samples per channel, the sound format and the volume. The sound card will configure itself to match the user’s specifications. During shutdown, the demo app will close the device ID.

If the visualizer is selected as the sound player, the visualizer API will require that the user choose the bounding rectangle on the screen where the visualization should appear and the colors that should be used for rendering the waveforms. During shutdown, the demo app must close the visualization window.

The sounds to be played will be chosen ahead of time, but should be configurable from some sort of human-readable file to make it easy to change which sounds to play. The config file should allow the user to select from the following types of sound:

* Silence — Create a sound that contains a silence of user-defined duration.
* Single Tone — Create a sound that contains a tone of user-defined duration and frequency.
* Recorded Sound — Create a sound based on a WAV file whose path is provided by the user. The sound file path should be verified and return an error if the file does not exist.
* Aggregate Sound — Create a sound that consists of any combination of other types of sound that will be played concurrently.
* Fade In/Out — Create a sound that has an existing sound and fades it in or out over time.
* Other Modifications – the company might have other modifications, like Fade, that it decides to include in the demo later, such as echo or autotuning.

The above sounds must each be able to generate an array of waveforms since that is the format ultimately supported by the player APIs provided by the company.

The sound player will play the sounds: the sound card will output a sound from the system speakers, and the visualizer will open a window to display a graph of the waveform.