Shane Cincotta, Ronan Tennant

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**Computer Assignment 1**

Takeaway from Experiment 1:

To begin experiment 1, I first had to install the numpy and scipy libraries. I had

Discussion of the effects of α and N on the reverberation results:

In our reverberation model, α and N represent the amplitude attenuation and the delay of each “echo”. Within a reverberation, each sound wave will eventually “hit” an object in the room (such as a piece of furniture), this object will “absorb” some of the signal, while reflecting some of the signal back. This reflection is what causes the echo-like sound. In our model α represents how much of the signal is reflected. In our main\_reveberation.py file, we set α to be 0.9, this means that after each reflection, 10% of the amplitude is attenuated. So, after 2 reflections, the signal has 81% of its original amplitude (0.9 \* 0.9) and so on. Thus by changing the value of α, we can control the reverberation time, which is the time required for the sound to “fade away” after the source of the sound has stopped ([1](https://en.wikipedia.org/wiki/Reverberation)). As α nears 1, the reverberation time will increase, and at 1 the reverberation time will be infinite (assuming an ideal case). As α nears 0, the reverberation time will decrease, and at 0 there will be no reverberation.

In our model, N represents the time delay between each reflection. This delay plays an important role in the effect of reverberation. If the time delay is too small (< 50 ms), the listener won’t be able to distinguish the echoes, and instead will perceive the sound as an “aura”, as if the sound was extended in time. If the delay is large, the listener will hear the delayed sound as a separate event from the direct sound. Thus, by changing the value of N, we can change the delay time between each signal.

Proposal for a better model of reverberation: