Computer Assignment #1

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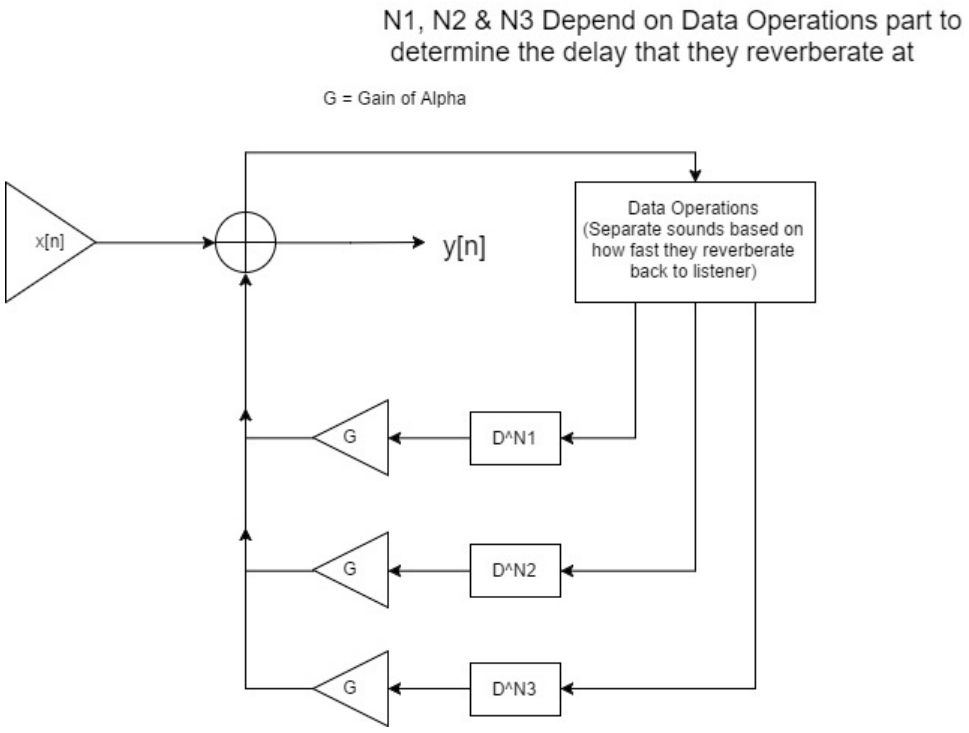
Our difference equation for the reverberation model in Section 2.2.2 is as follows:

$$y[n]=x[n]+\propto y[n-N]$$

Therefore, the impulse response, h[n] of this model would be:

$$h[n]= \partial[n]+\propto h[n-N]$$

Using a block diagram to represent a move sophisticated model of reverberation:



The reverberation results are effected by both α and N. α determines the gain in which the reverberated sound is amplified based on the room the listener is in. N determines the amount of time it takes for the reverberated sound to reach the listener, also depends on the room.

Problems during software programming:

Several problems occurred during programming. One problem was figuring out how the convolution can be coded. The obvious way to do it was with for loops. Although since we used lists to contain the data, for loops if not programmed correctly would often go out of range of the list and crash the program. We solved this by adding dummy zeros to the end of each lists to avoid the for loops from not completing the convolution.

Another problem that occurred was after each convolution was created, the first value in each list was a zero. We simply popped the first value from the list and the convolution was corrected. Our final problem before we got our code to work was getting the main_stereo program to work with our code rather than just dummy values we used. At first it would crash because our program used standard python lists, while main_stereo used numpy arrays. Once we realized we realized we were using the wrong data type, we went back to our code and converted our lists to numpy arrays. After that we ran our code and it created an output sound file.

Unexpected results:

Our main unexpected results occurred during the coding of the for loops for the convolution and reverberation. Most of the time we would get an output but it would be completely wrong. The values that is outputted would generally be slightly off on what they were supposed to be. After several hours of manipulated the for loops, the code created the correct output.