Core:

The reason I have chosen 44160 to be my sampling rate is because it's the average sample rate for most music and it gives enough samples per second to produce good quality sound

I calculated the total numbers of samples by multiplying the sample rate with the duration of the tone. This is because the sample rate is the samples per second and the duration is how many seconds

Types of variables selected for my project:

Sample rate:

I have chosen integer variable because the sample rate can't ever not be a whole number.

Duration:

I have chosen double variable because it is possible, we might not want the tone to last longer than a whole number.

Number of samples:

I have chosen double because we are getting a value by multiplying it with a double which may leave to decimal numbers.

Time between samples:

I have chosen double because we are inverting the number of samples which will always give us a decimal number unless the number of samples are 1.

Frequency:

I have chosen double because there are many notes that use decimal number frequencies.

Volume:

I have chosen integer variable because adding decimals won't affect the volume a lot and isn't worth taking up more memory for it
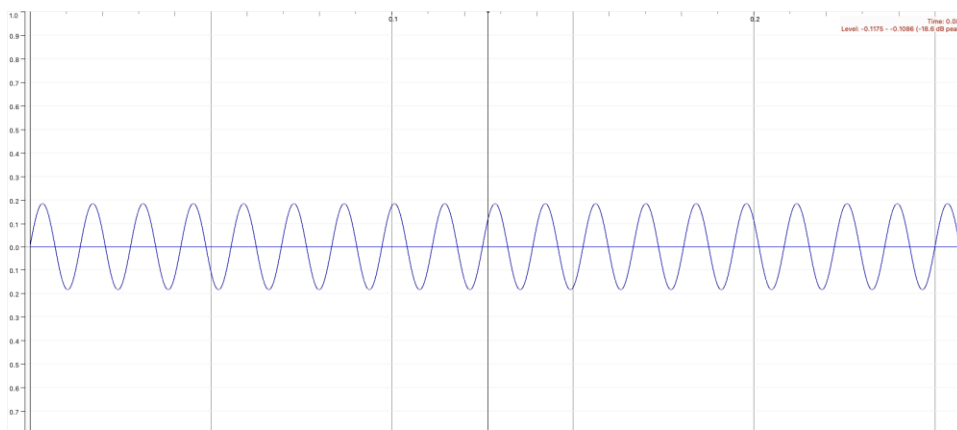

My wave form is exactly what I expected as I have added anything to change the amplitude of the sine wave or additional sine waves, I indented to see a basic uniform sine wave set at 305hz.

Completion:

Another way to change the frequency during the duration of tone is by using an odd and even function(mod) by making an algorithm and one to the beat after a set variable of time then have one frequency for the odd beats and another for the even beats. The odd and even function works my dividing the variable by 2 and if there are no reminders it means it's even and if there's a reminder it odd.

Challenge:
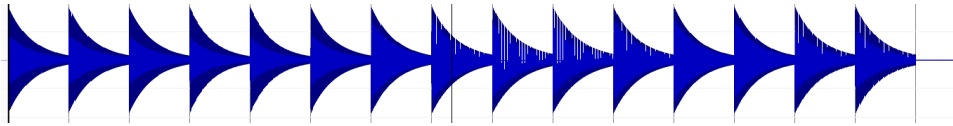
When trying to recreate the sound of a piano note I made my wave produce a high amplitude for a sharp sounding attack then using an exponential decay equation to make a long decay function for the amplitude this helps it sound more like how a key on a piano sound like instead of artificial. I have also added additional sine waves as harmonics as when pressing a key on the piano it also vibrates other notes in the piano which leads to different sounds than what's expected of the frequency.