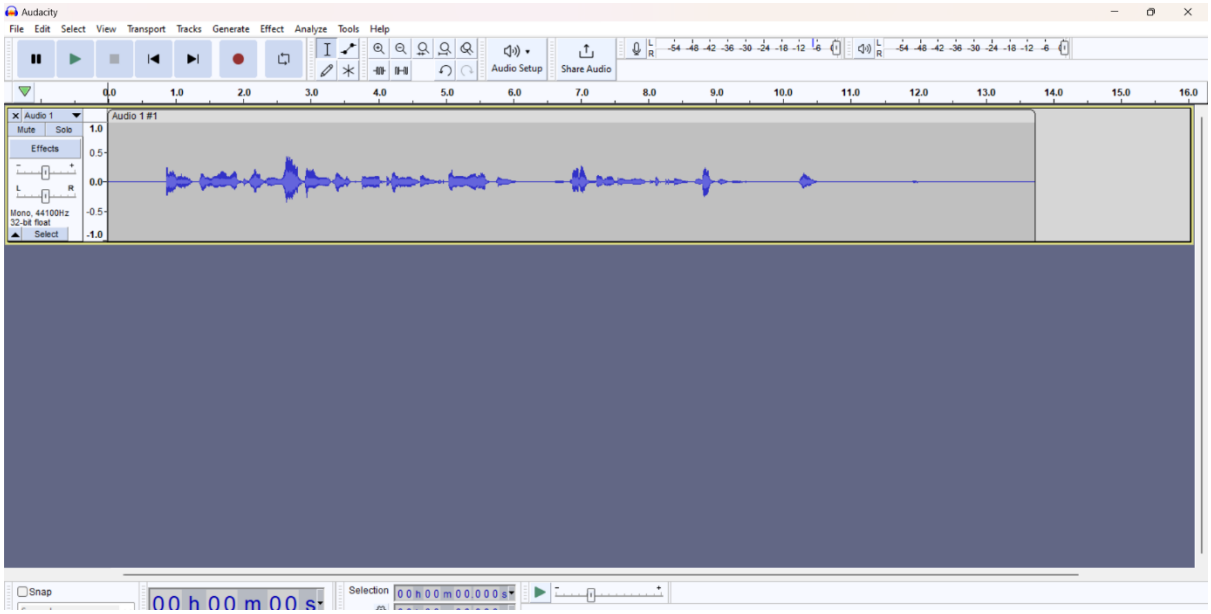
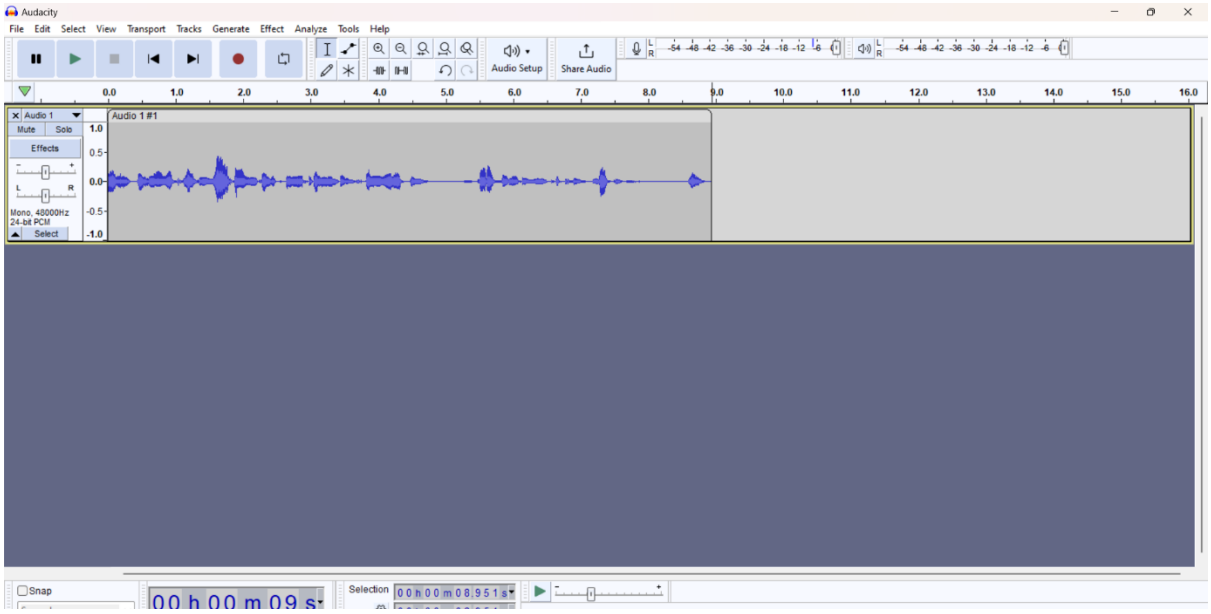
Starting this project felt like stepping into a vast realm of possibilities, and I must say, it was both daunting and exhilarating. The goal was to create an audio processing application using the p5.js library, involving recording, editing, processing, and saving audio files. Drawing inspiration from Rudyard Kipling's "If—," I set out to record, edit, and refine audio, making it a journey of exploration and creativity.

Recording the chosen lines from the poem felt like capturing a moment in time. Striving for an optimal recording level without encountering the dreaded clipping was a challenge, but a challenge that made the process even more engaging. I edited the recording to eliminate potential silences at the beginning and end, ensuring a polished audio file. I then went further to normalize the recording and saved it in WAV format, adhering to a 48 kHz and 24-bit configuration.

UNPROCESSED AUDIO



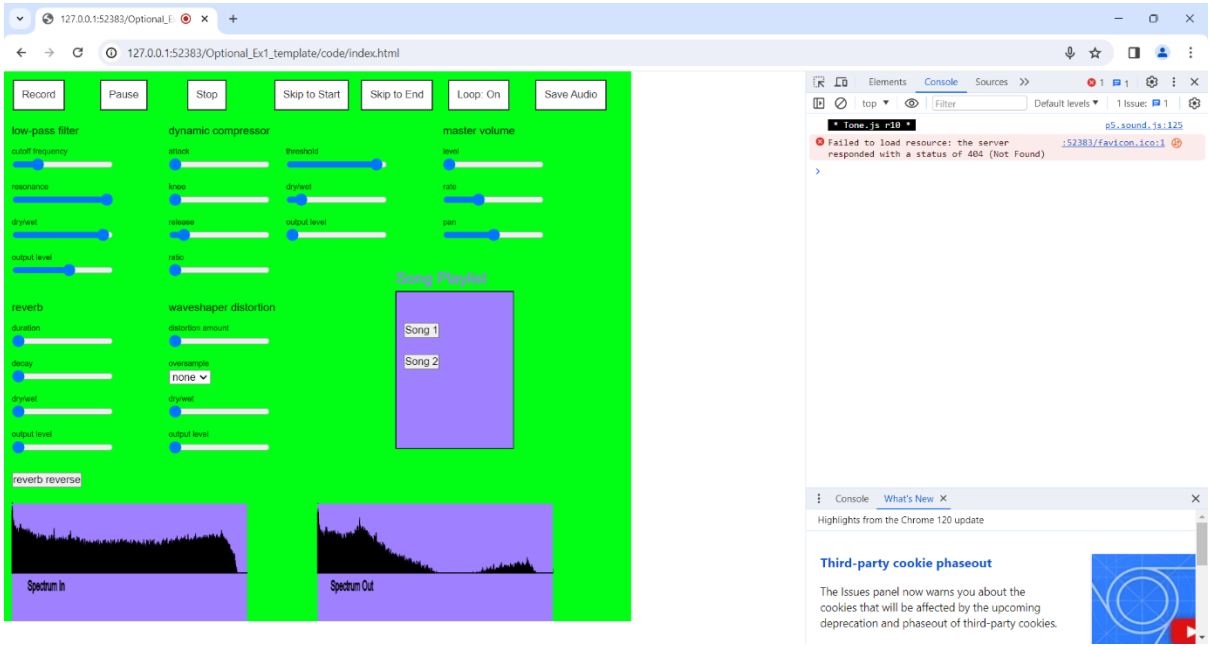
PROCESSED AUDIO



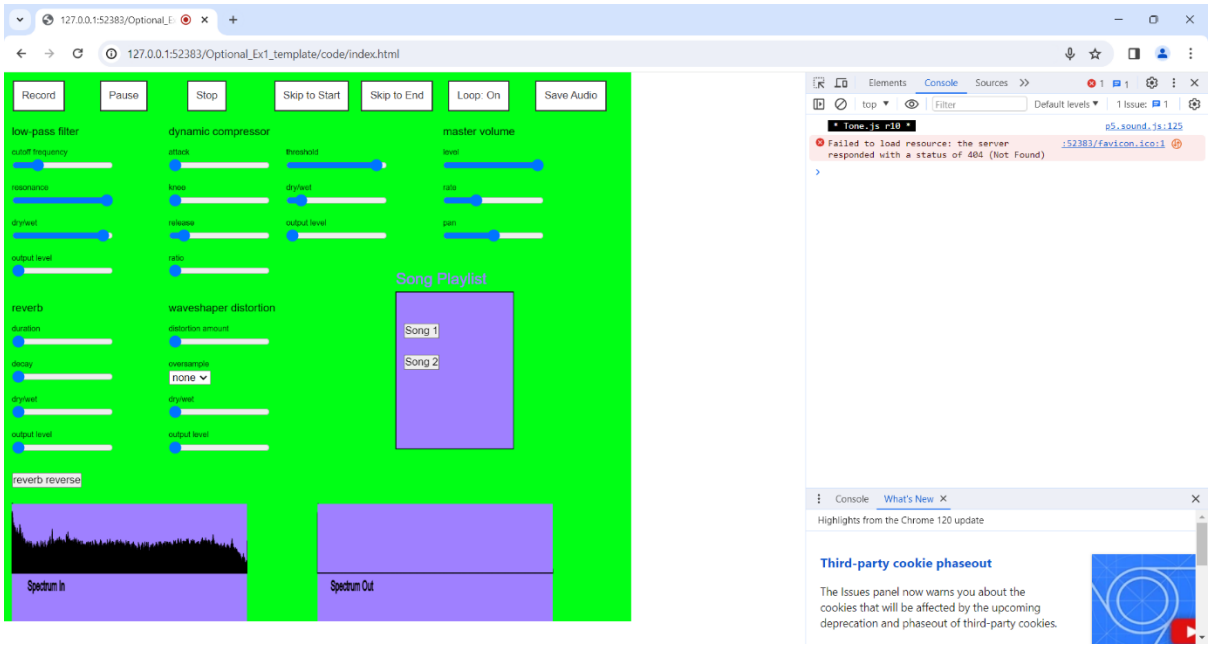
Programming the various audio effects using p5.js was an adventure filled with twists and turns. The core of the project lied in implementing various audio effects using the p5.js library. These effects include a low-pass filter, dynamic compressor, master volume control, reverb, and waveshaper distortion. I programmed each effect as a separate function, allowing for modular and flexible audio processing. The interconnection of these effects is established by chaining them in the desired order, forming a comprehensive audio processing chain.

The low-pass filter and master volume controls emerged as the maestros directing the sound spectrum. I configured the low-pass filter with adjustable parameters such as cutoff frequency, resonance, dry/wet mix, and output level. The master volume control, on the other hand, adjusts the overall output volume logarithmically.

An intriguing observation is made when the low-pass filter's output level is set to zero. In such a scenario, the output spectrum becomes entirely attenuated, yielding a silence effect. Additionally, even if the master volume is set to 100 while the low-pass filter output is zero, the overall output remains silent. This behavior underscores the interdependence of these effects and the need for a balanced configuration to produce audible results.



ZERO OUTPUT LEVEL ON THE LOWPASS FILTER



To enhance user interaction, a playlist feature is incorporated, allowing users to choose from a selection of pre-recorded audio files or filter their recordings in real-time. The addition of rate and pan controls provides dynamic adjustments to the playback speed and stereo panning, adding versatility to the audio playback experience.

Sure, there were challenges along the way, moments of head-scratching and debugging. Yet, each challenge became a stepping stone to learning. The implementation hurdles were not roadblocks but rather invitations to understand the intricacies of audio processing better.

In conclusion, the audio processing application successfully integrates recording, editing, and processing functionalities, offering users a platform to experiment with various audio effects. The low-pass filter and master volume controls significantly influence the sound spectrum, highlighting the intricate relationship between these effects. The inclusion of a playlist and dynamic controls for rate and pan enhances the application's user interface and functionality.