

Creative Computing

CA2 - Generative Agency

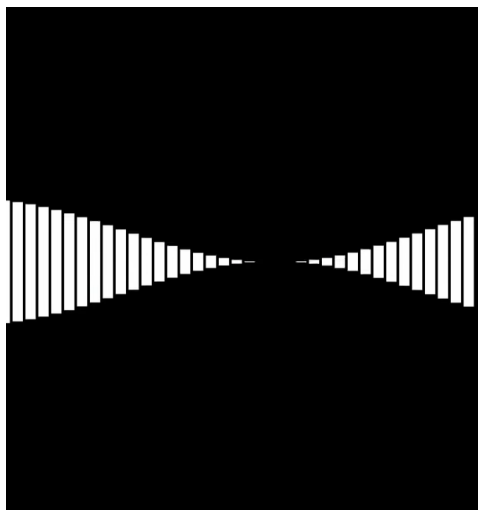
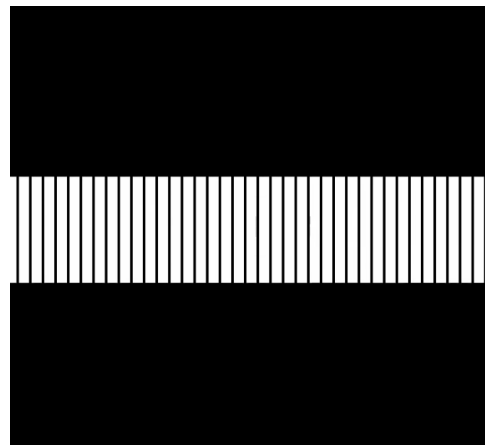
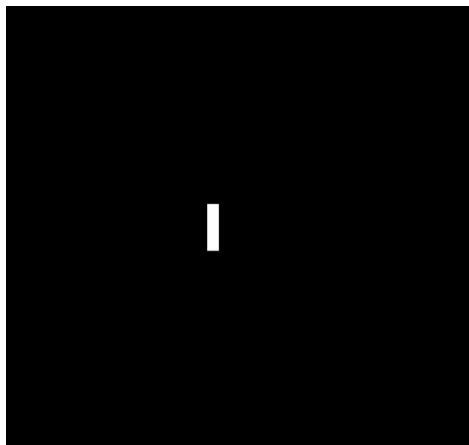
Ryan Graves - N00172376

Introduction

Create an algorithm for cube oscillation using WebGL. The library will add three-dimensional functionality which serves as the basis for the transformations from an implemented sine wave. The project will use a GUI library for user interaction and the p5 sound library. The library will be used to modify the amplitude of the audio to the amplitude of the sine wave which will create a mapping between the two.

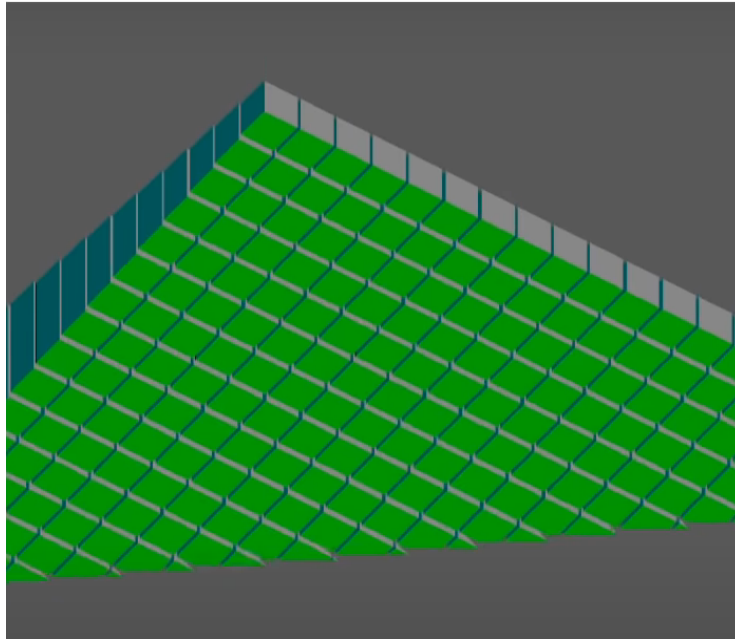
Methodology/ process

The process began in two dimensions by creating a series of rectangles that exhibit a sine wave for oscillation. Once the functionality was finished, then the project would move to 3D.

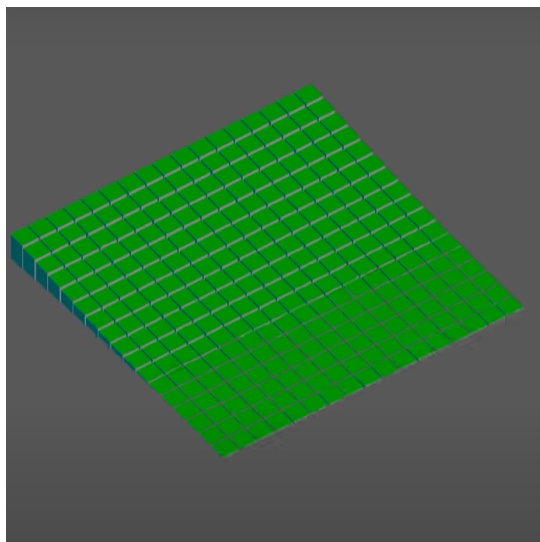


WebGL

Once the oscillation functionality was implemented, the next step was to switch from two-dimensional space to three-dimensional space. An initial problem was adjusting the camera perspective to include all the cubes. A problem to be solved was camera culling, with WebGL the scope of what the camera frustum could render needed to be taken into account. The below image highlights camera culling as the lower quarter of the sketch is being culled.

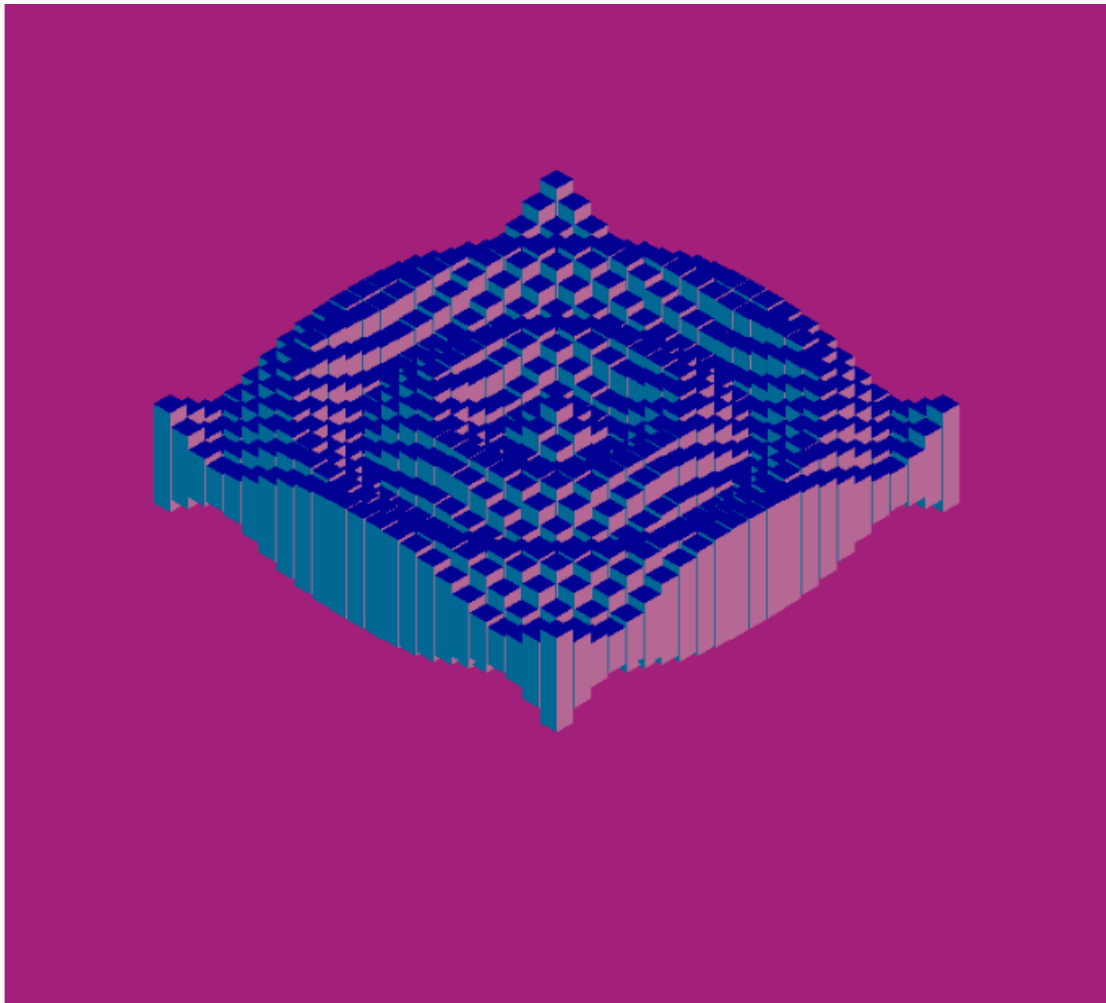


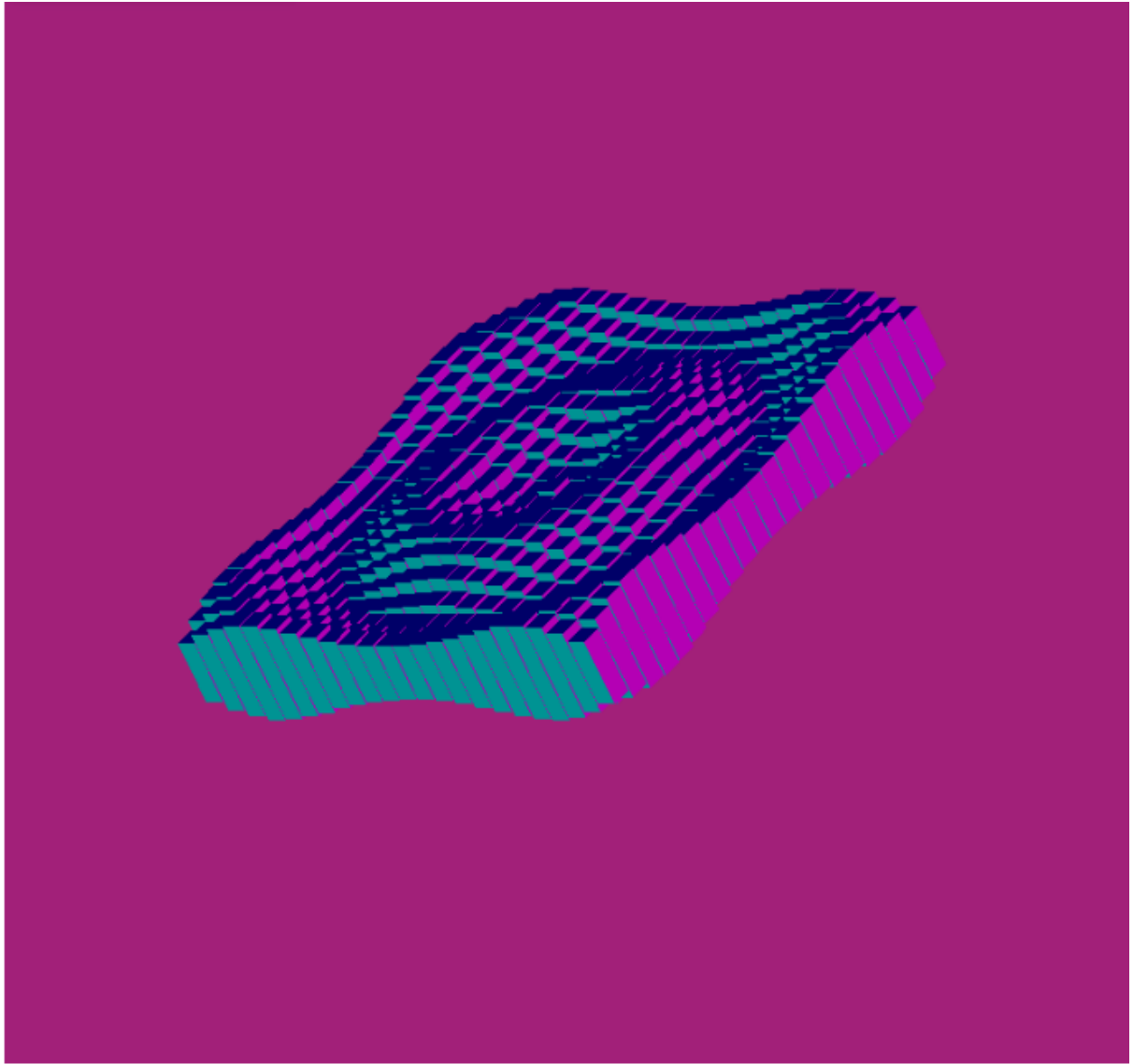
To fix the issue, the camera had to be translated to an appropriate position and the viewport need to be expanded. Once resolved, the scene was then changed to an orthographic project, the reason for this choice was the scope of the sketch fit more appropriately within an orthographic projection, which means the sketch could be scaled. The image below demonstrates the resolved issue, now in orthographic projection.



Final Render

The finished sketch uses all of the above functionality, with an incrementing value mapping the period of the sine wave, creating a dynamic pattern that changes over time. The images below demonstrate the sketch from two rotations, that the sketch itself will switch between using framerate counter. The sketch features a GUI which allows the user to affect the amplitude, period and angle of the canvas.





Conclusion

The project implemented offset oscillation using a sine wave while the sketch implemented WebGL to expand to three-dimensional functionality. The sound library was used to map the amplitude of the sound playing to the amplitude of the sinewave, creating a dynamic sketch that changes over time.