AS1 - CS 411

Homework Questions

Can be found in docs/AS1 Mostafavi Questions.pdf

Challenges

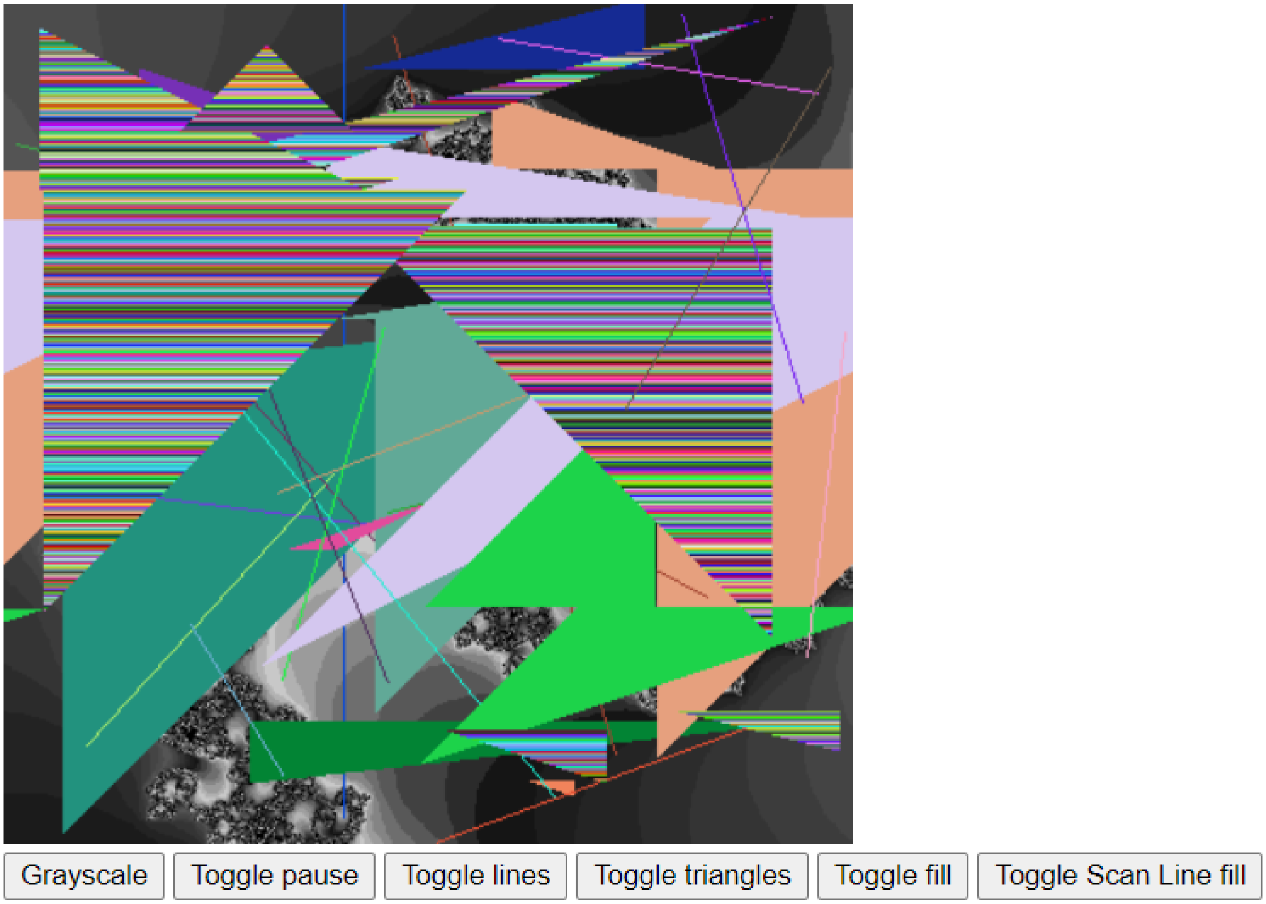
For my line drawing algorithm, things were pretty straightforward. After reviewing the starter code, I did some basic research on various versions of the Bresenham line algorithm via the Wikipedia link provided in the notes, and generated a clean solution using a single while loop and iterating through incrementing by the slope until my starting and ending x and y values were the same. This generated nice triangles, and it worked well with starter code provided.

I continued onto the scanline algorithm and this is where my problems started. I had a very hard time coming up with a basecase for the situation, but eventually I determined that the basecase was a top facing or bottom facing triangle where 2 vertices had the same y values (i.e. were in line with each other). After this, writing the algorithm was much easier, but my solution still did not work. After tons of debugging, I determined that my line algorithm was getting stuck in an infinite loop, as I was incrementing a float by an integer, meaning there would never be a point where my starting x and my ending x would be equal. I solved this by flooring every coordinate that was passed into the line algorithm, which allowed it to break free. Then, I just did some basic debugging and trial/error to make sure that both the top and bottom triangles were drawing correctly.

It also turned out that console.log() for every pixel drawn in the line algorithm severely decreases performance. Once removing all print statements (except toggles) performance returned to expected rates.

Demo

As seen, all aspects of the project work correctly.
Tested in Google Chrome Version 93.0.4577.82 and briefly checked in Microsoft Edge.


Grayscale
Toggle pause
Toggle lines
Toggle triangles
Toggle fill
Toggle Scan Line fill