MiniRT

In this project we are tying to make a program that will render full 3d maps with 3d objects and will actually simulate light! By this time im making some headway but its been pretty frustrating and I predict it will get worse so here are my notes for the current point.

Optimizing at the start

The very first thing I thought of doing was thinking of how to make the rendering faster so I asked some people and searched a bit and these are the some methods:

1. **Upscaling**: render an image of smaller size than the window them scale it up to fit, this way we can reduce the number of thus reducing the work but the image quality will also be lowered.

2. **Bounding volume hierarchy**: this technique

Upscaling

I started implementing up-scaling at first I just repeated every other pixel but that gave me some pretty weird results so later I found that the way this is usually done is by taking one pixel from the smaller img and mapping it to a neighborhood of pixels say 4x4 of the big image (window). I tested I out, it works and so I was happy, now I have one optimization option available.

After I up-scaling I wanted to display even the most simple 3d enviroment this got pretty tricky pretty fast, I hade some generated code I planned to understand once I saw that it worked but it dint at least not in a satisfactory way and there where some optics concepts I dindt wuite understand like fild of view and perspective as well as some linear algebra I had to refresh in my mind.

The first step in the right direction was to check that the inputs worked properly, sure I couldn't see anything yet but at least knowing that the coordinates changed properly allowed me to visualize in my mind what I could expect once I started rendering objects.

I tried a sphere, then a cube but both proved tricky for me and grook so I just setled on a plane and as per fild of view and

perspective ignored all of that and started from a simple paralel
projection.