# COSC342 – Assignment 2

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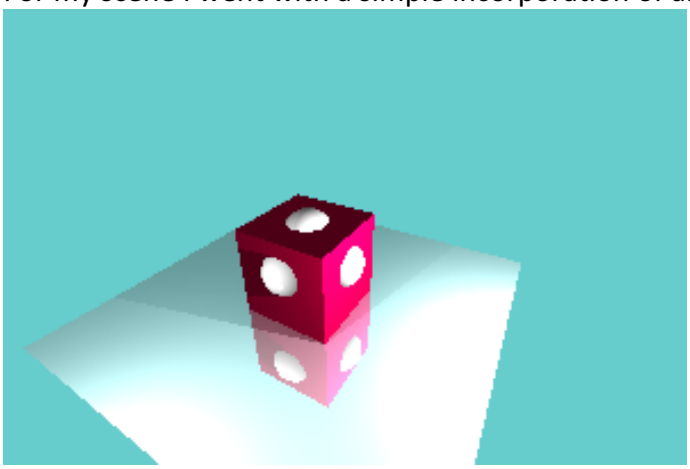
I began the the assignment like most others implementing the plane object and after a bit of guidance I was able to get it to work. The program follows the lab instructions to transform the rays, compute the intersection and making sure the inverse direction ray isn't zero or very small. Then checking if the intersection is larger than zero it finds the hit point and computes all the details of the hit point including the material, the normal and distance.
The cube implementation works very similar to this as it is made up of other planes. Everything done in the plane class is essentially just repeated multiple times with a few adjustments like changing the normal and the approach of zero checking.
For the computeColour section I began with gathering al the variables needed for the Phong Illumination Model. I then calculated the dot products needed in the model making sure that they resulted in 0 or positive. Then the shadow rays were created using a previous vector for the shadow direction. After that the program checks if the hit point is in a shadow and if not it will add the colour/ lighting to it.
The mirror effect was implemented recursively by calculating the mirror ray and then calling computeColour again and using the new mirror ray with a decrement in rayDepth as the new parameters for the method.

Unfortunately, that was as far as I got with the program due to time constraints. I tested each of these components using the scenes given in the lab which I would change around to get a better look at the objects. For example, I would rotate the object around, move the camera to make sure it was consistent from different angles. I managed to get pretty good results out of each of my tests.

For my scene I went with a simple incorporation of all the facets I worked on.



It has the plane as the ground with a mirror effect on it which shows the reflection of the object on the plane. On the plane is a cube with three spheres protruding from it, I used this as it is and unusual object which gives unusual shadows and reflections. I thought this showed what I worked on well. It does look a little pixelated which I am not sure how to fix (increase render size?) but overall somewhat happy with the picture. Obviously I would've

liked to finished more in the assignment, so not overly happy with my work in that regard but with what I've got I am happy with.