Assignment 3

Ray Tracing

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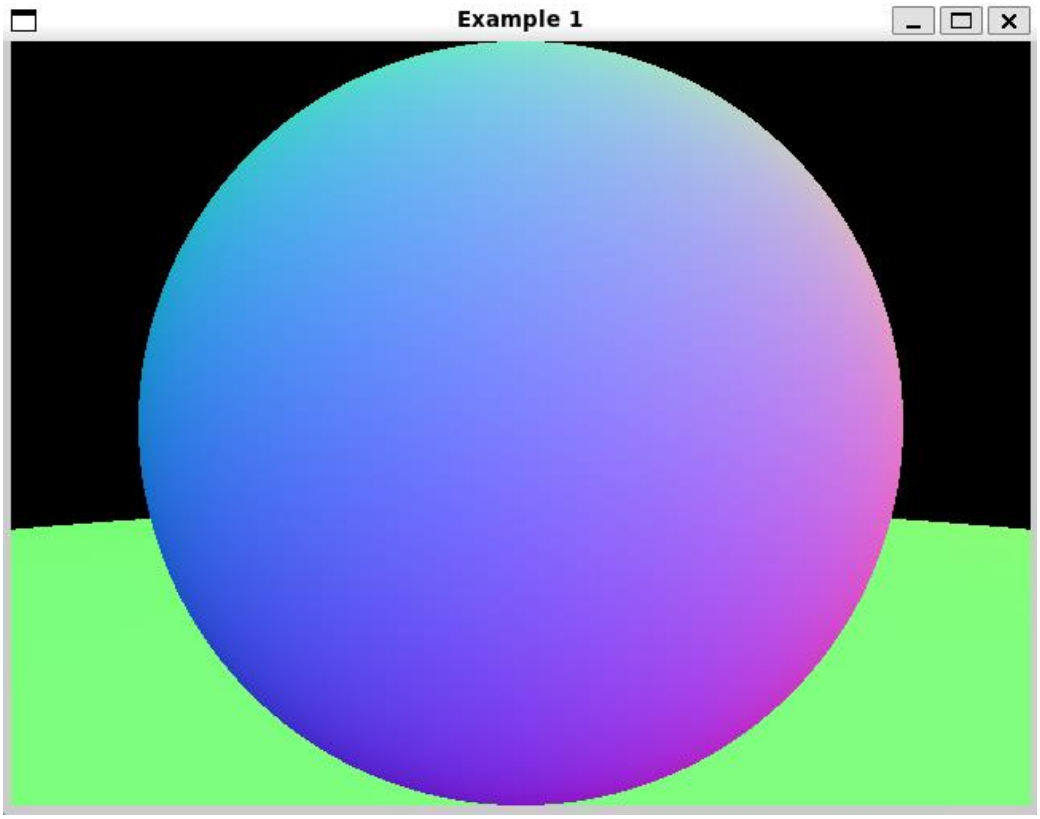
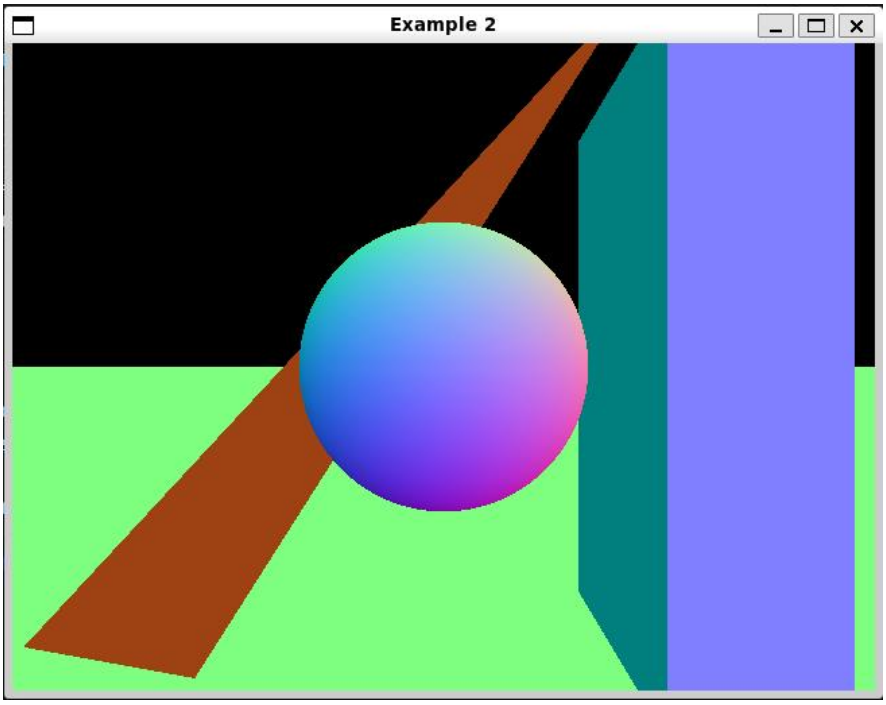
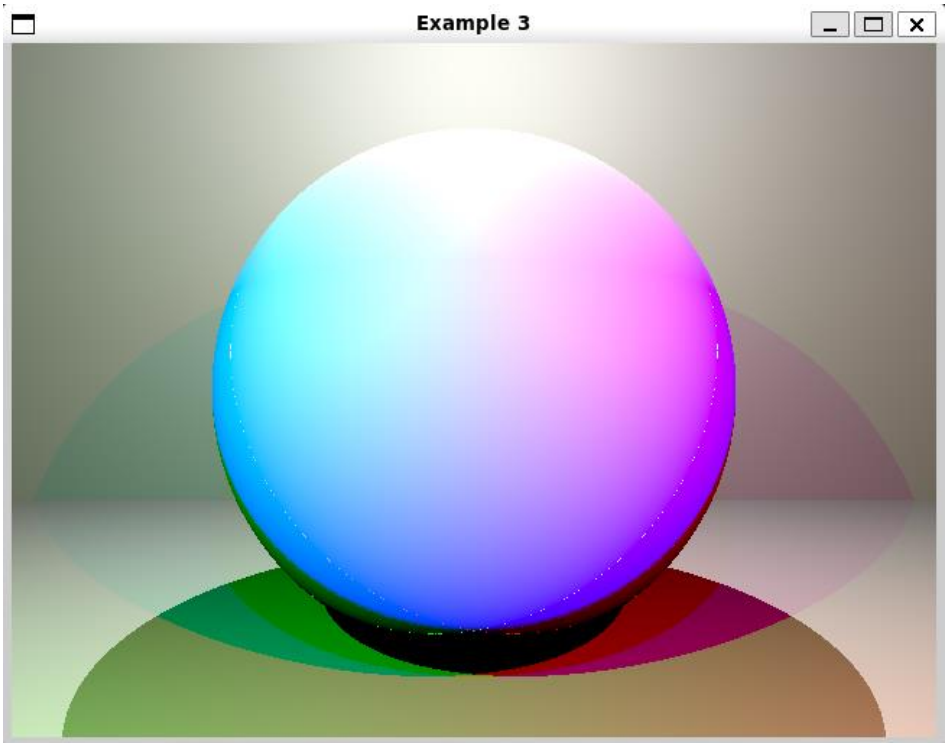
1) 2 spheres rendered in normal visualization mode



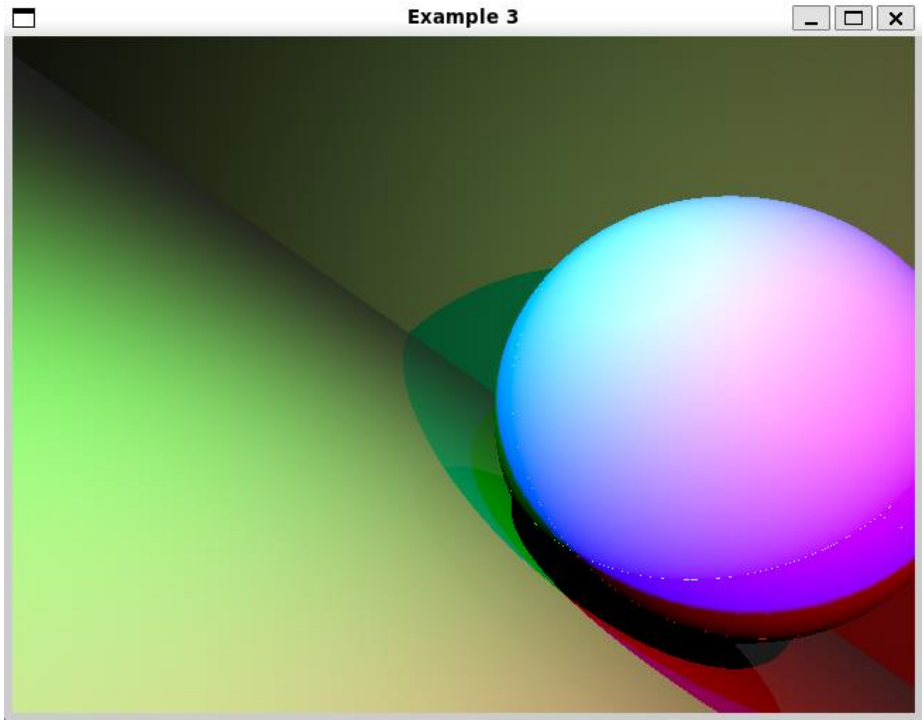
2) With plane below it (we have also implemented for axis aligned boxes and triangle which is shown in the image below)



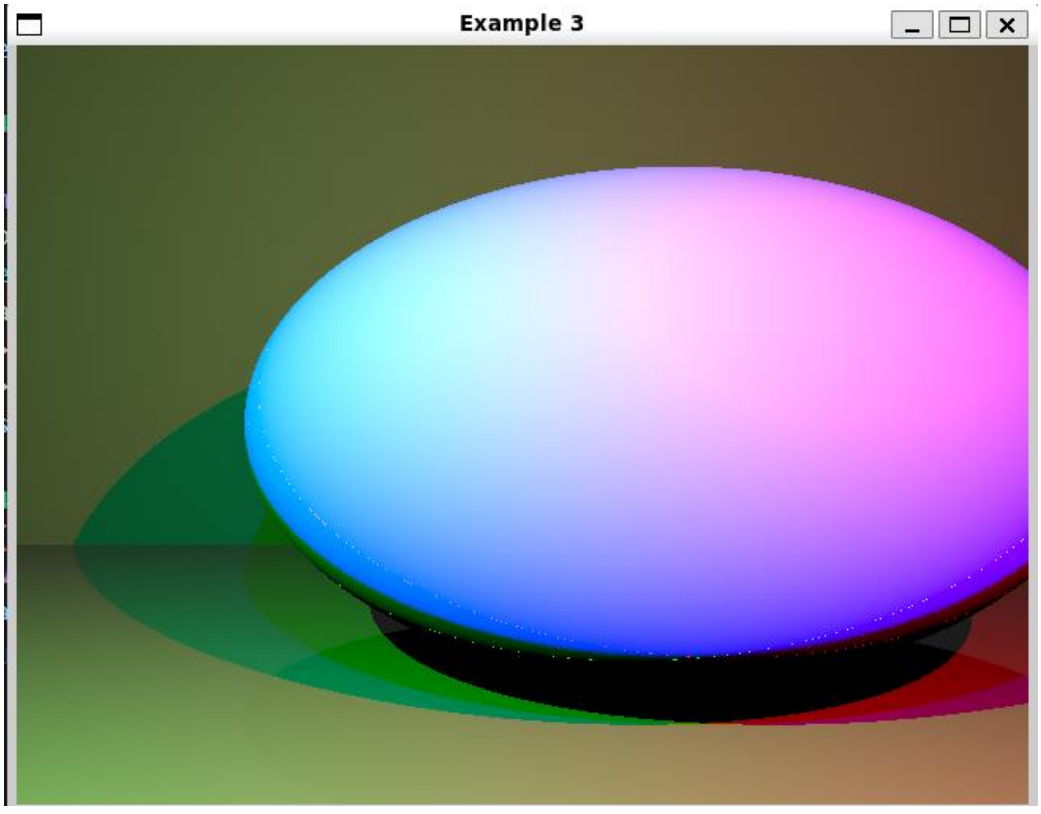
3) This is a scene with 4 light sources, one is white, the other three are red, blue and green



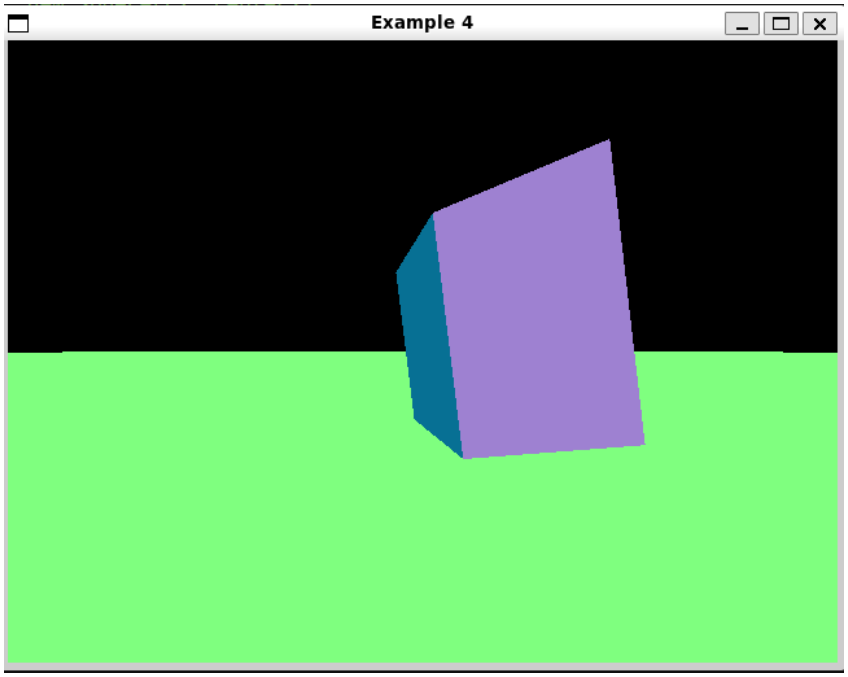
4) Translating and rotating the camera on above scene (and also shifting the upper light far away from the scene)



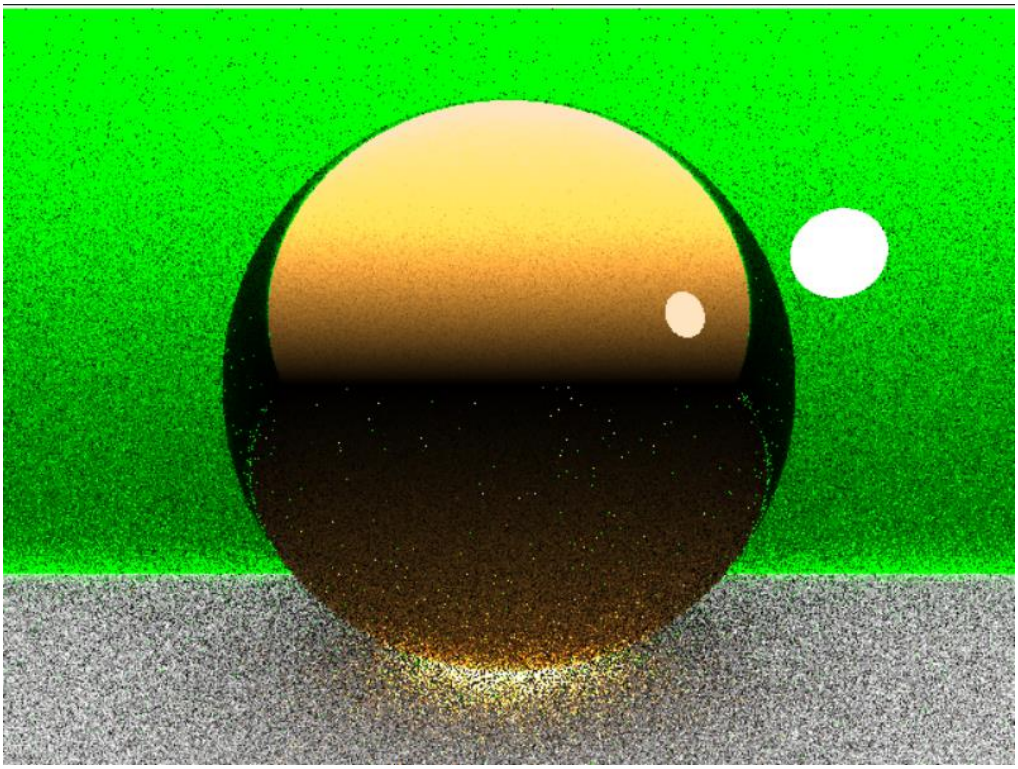
5) Translating the above ball and scaling it to make it an ellipse



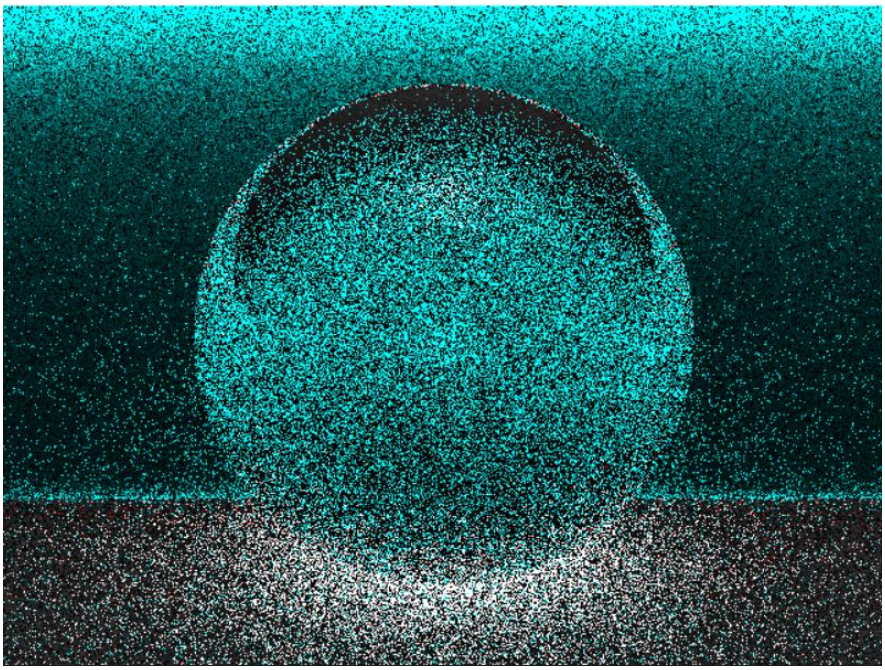
6) Rotating an Axis aligned box



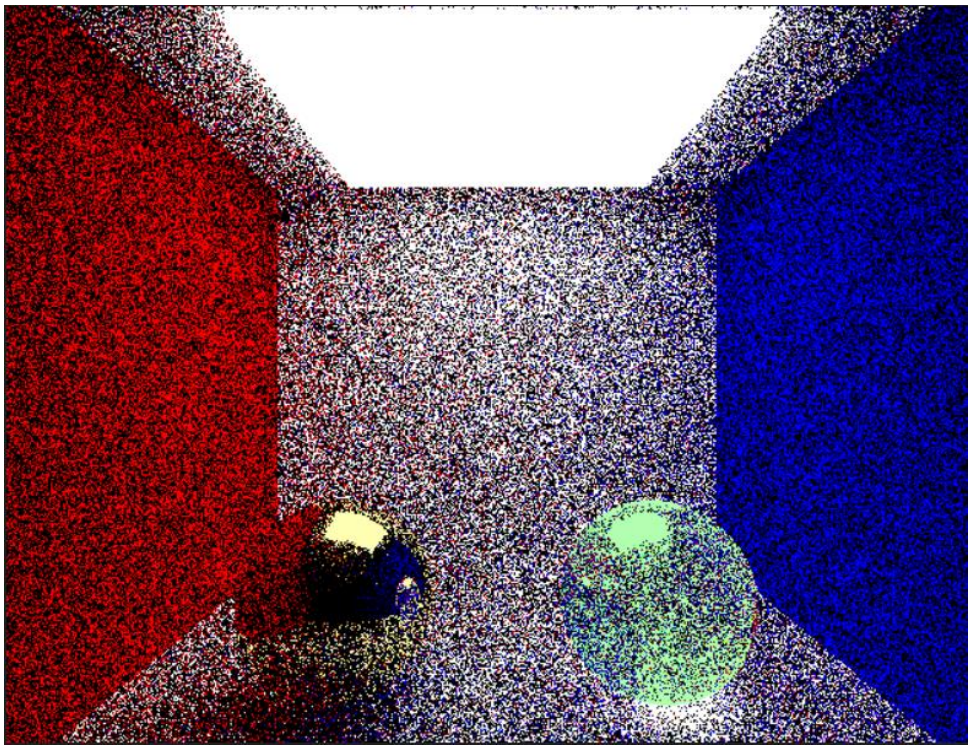
7) A metal ball (perfectly reflective) with an infinite light plane above it and another spherical light source to the right. There is a green coloured plane to the back.



8) A glass ball with an infinite light source above



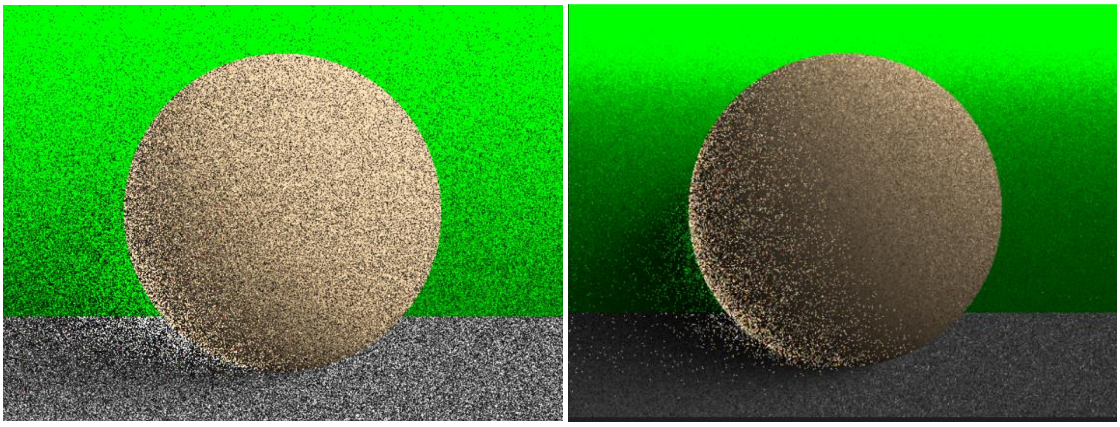
9) A scene with a metal ball and a glasst ball. All the walls are diffuse materials. There is a light source at top as seen.



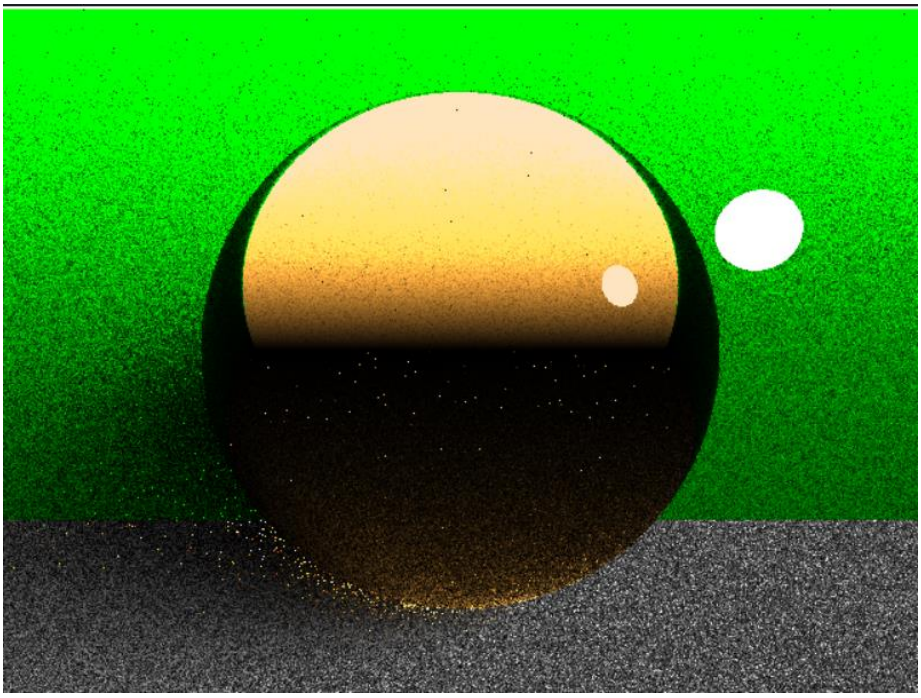
By careful observation we can also see reflection of the glass ball.

Now, we did cosine weighted sampling and Russian roulette. But we encountered some spiral distortion of the space when we did cosine sampling, the results could be seen like this.

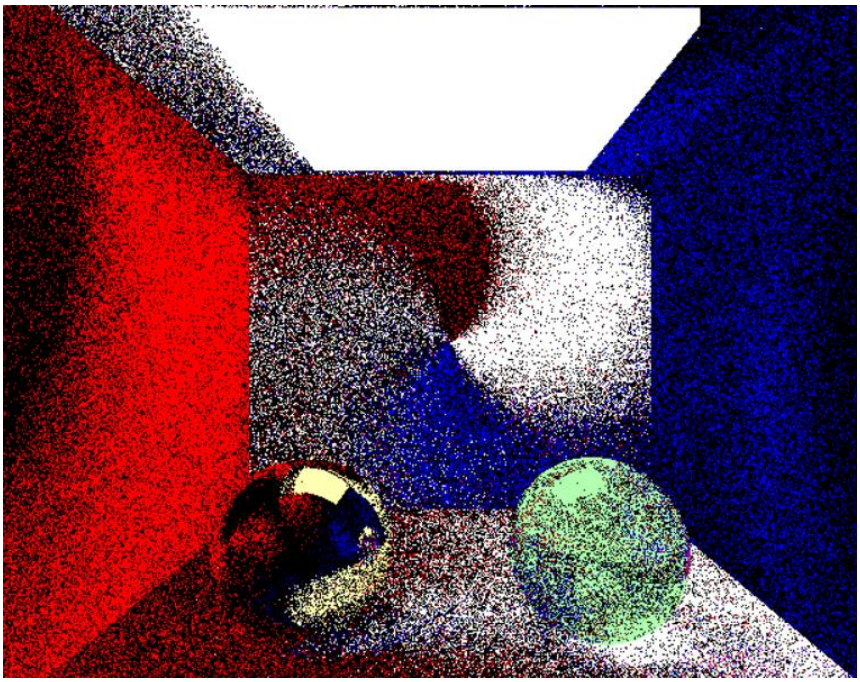
10) A diffuse material with cosine weighted sampling on 2 and 10 sample per pixel respectively



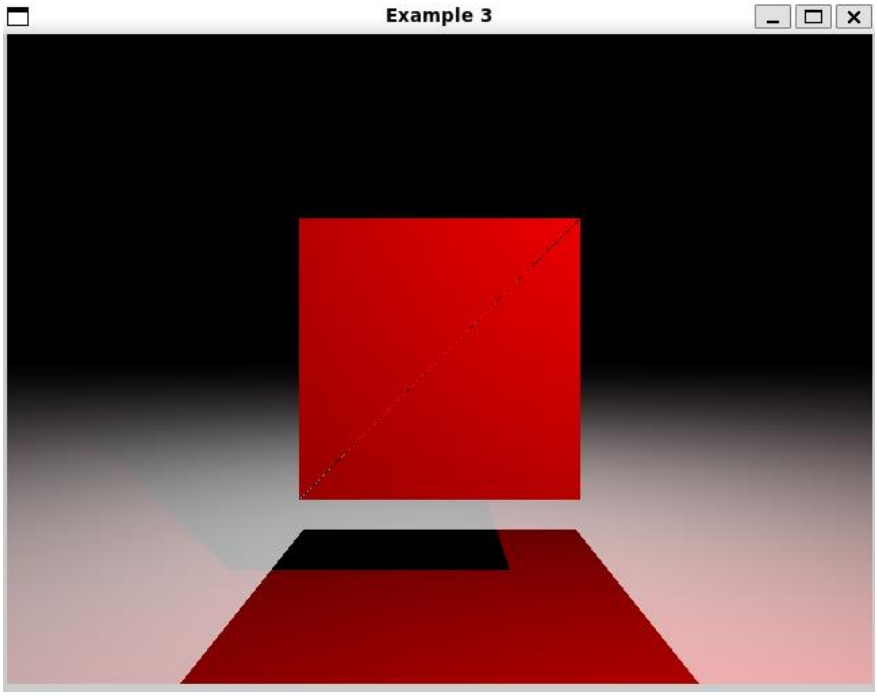
11) The metal ball with 5 sample per pixel



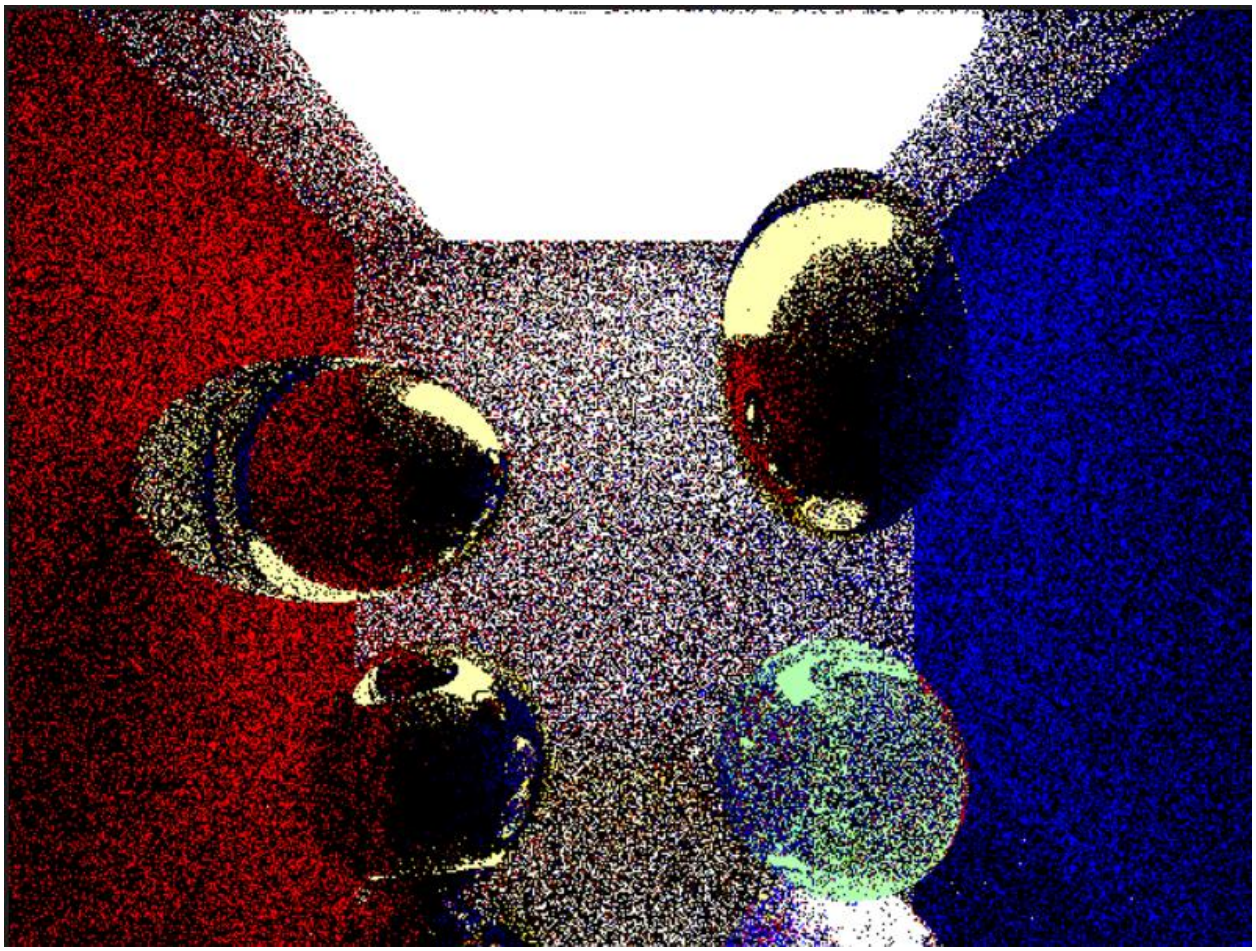
12) The same scene with 3 samples and cosine sampling (which is not quite correct but variance is reduced)



13) We have made mesh also in our scene, by loading the meshes from assignment 2. But for larger meshes it is computationally more heavy so we are not able to render them. We are able to render the cube from assignment 2.



14) The scene for part 8



We were not able to carry out importance sampling as can be seen by distortion caused by cosine sampling. Also the results were noisy as can be seen in the figures. With higher samples per pixel, the code was getting killed.