CSC418H Assignment 3

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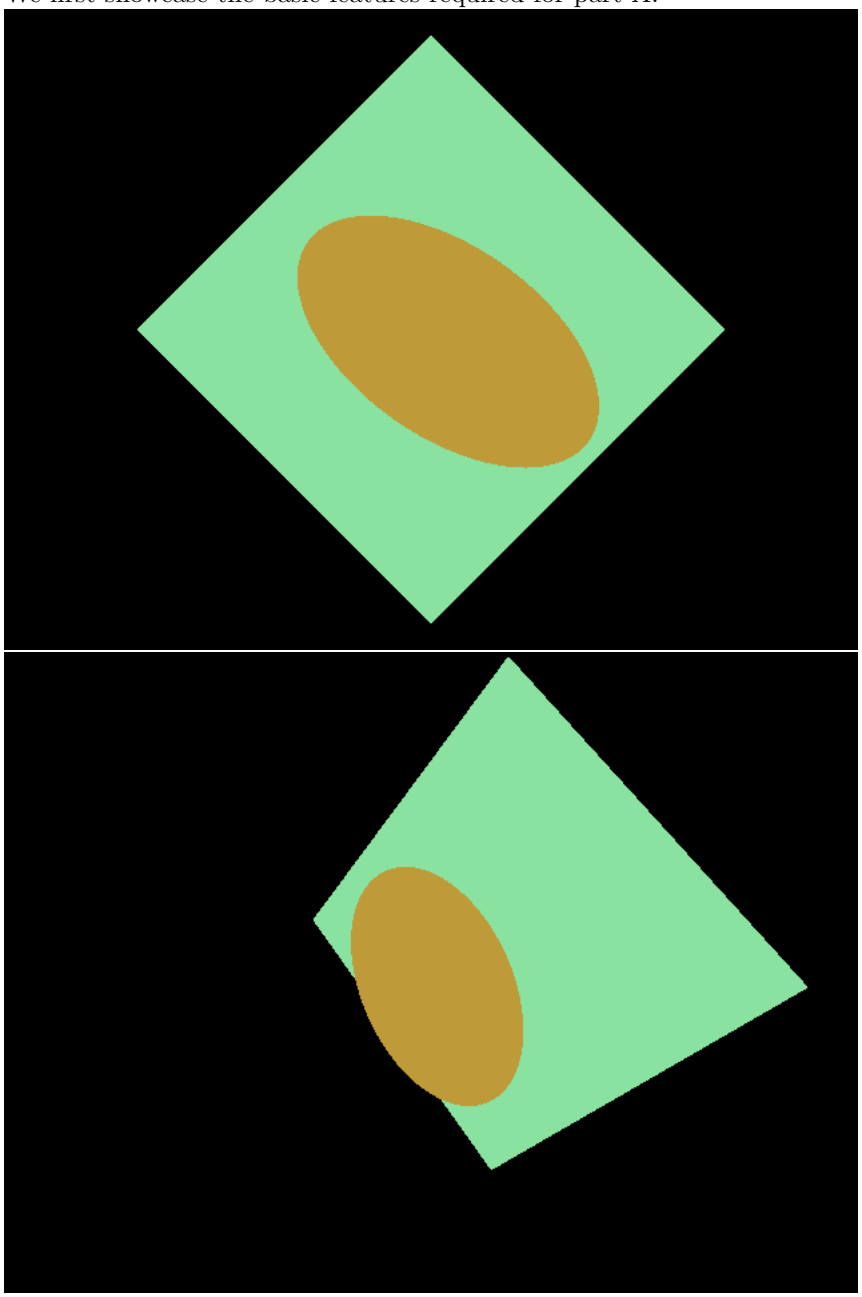
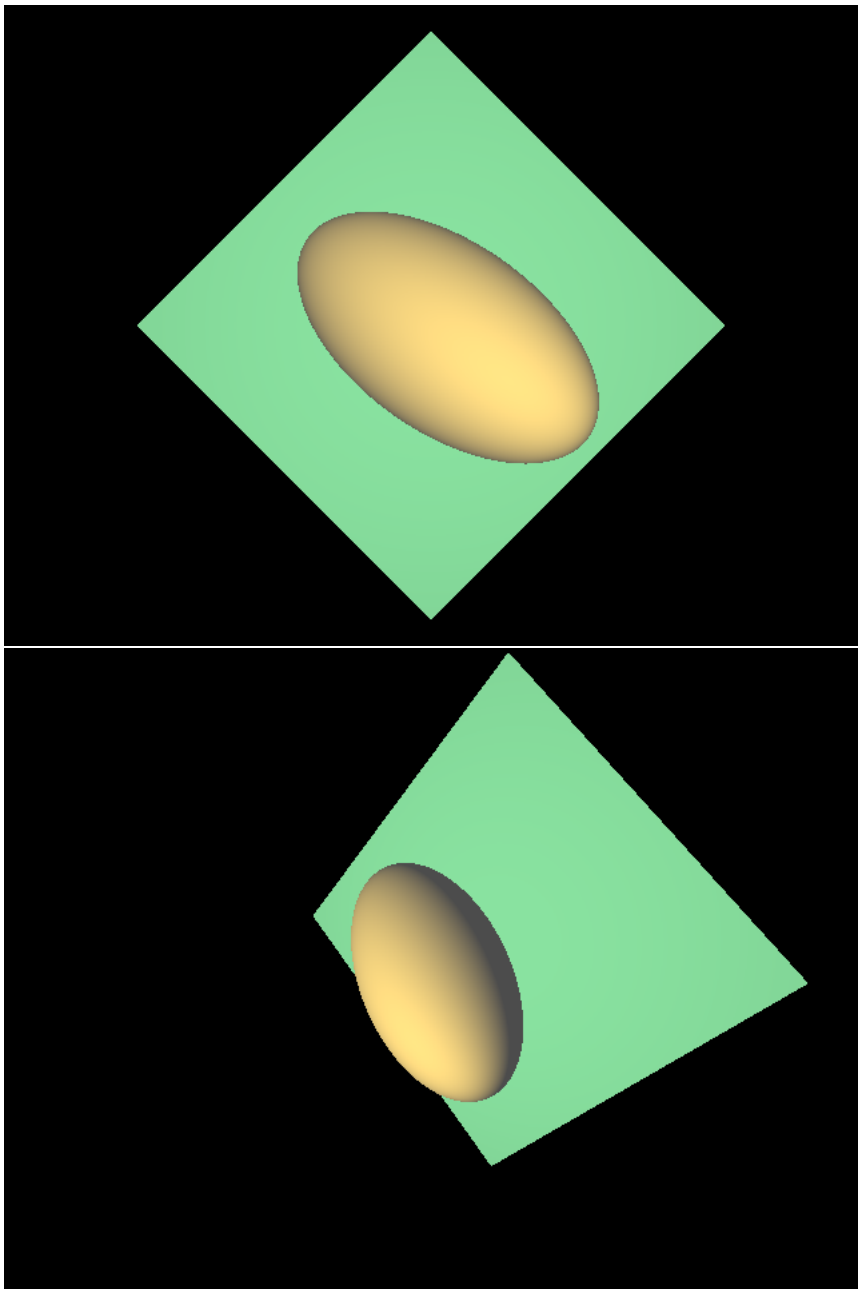
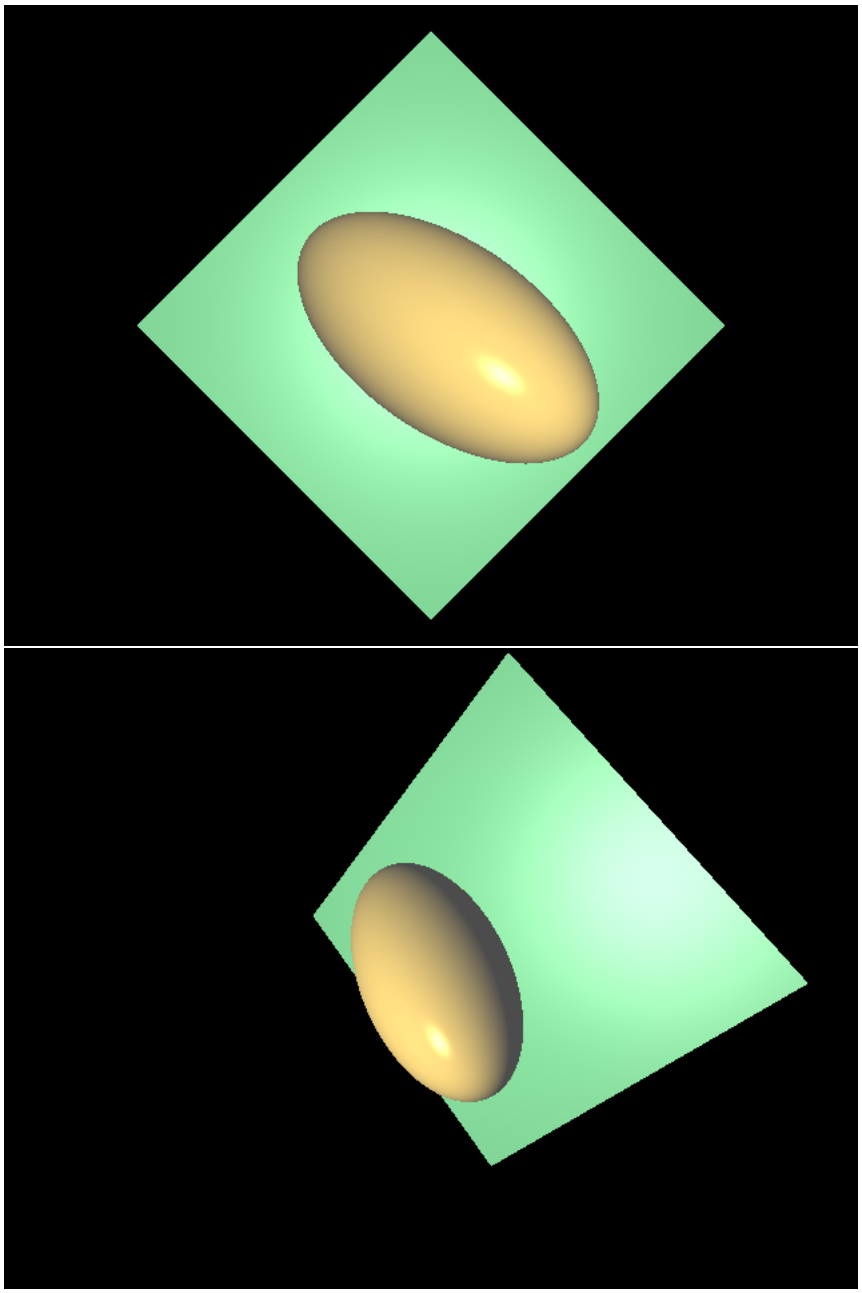
1. Overall submission
   This submission includes all the code and everything we've used to produce assignment 3. We have included the images in the submission

2. Code
   The code is straight forward and unchanged. We've added a few flags to help testing, including MLTI_LIGHT in main.cpp, ANTIALIASING, RAY_TRACING_DEPTH, GLOSSY_REFLECTION and HARD_SHADOW in raytracer.cpp. Softshadow is enabled automatically if HARD_SHADOW is set. We turn off alot of these flags for debugging.

3. Features
   We first showcase the basic features required for part A:

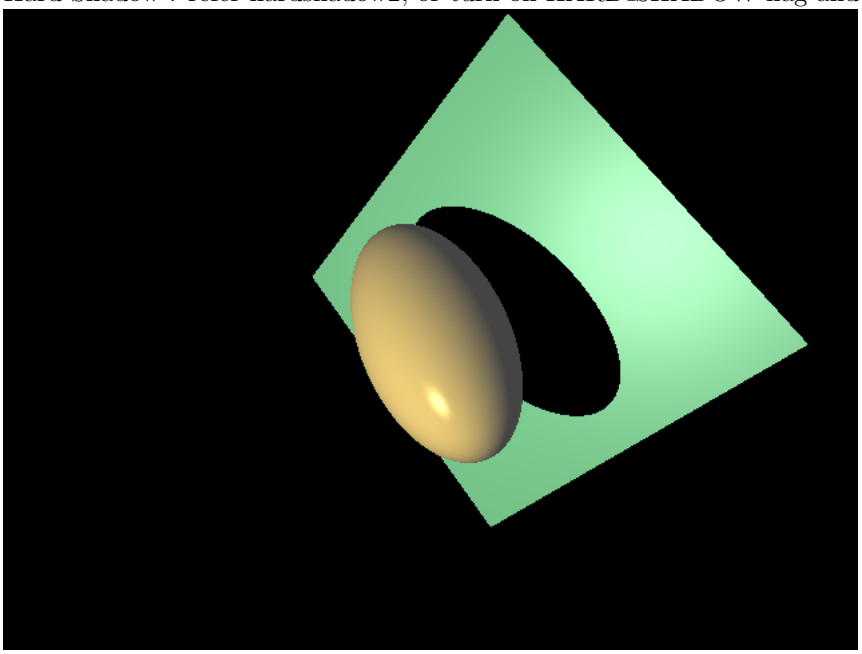




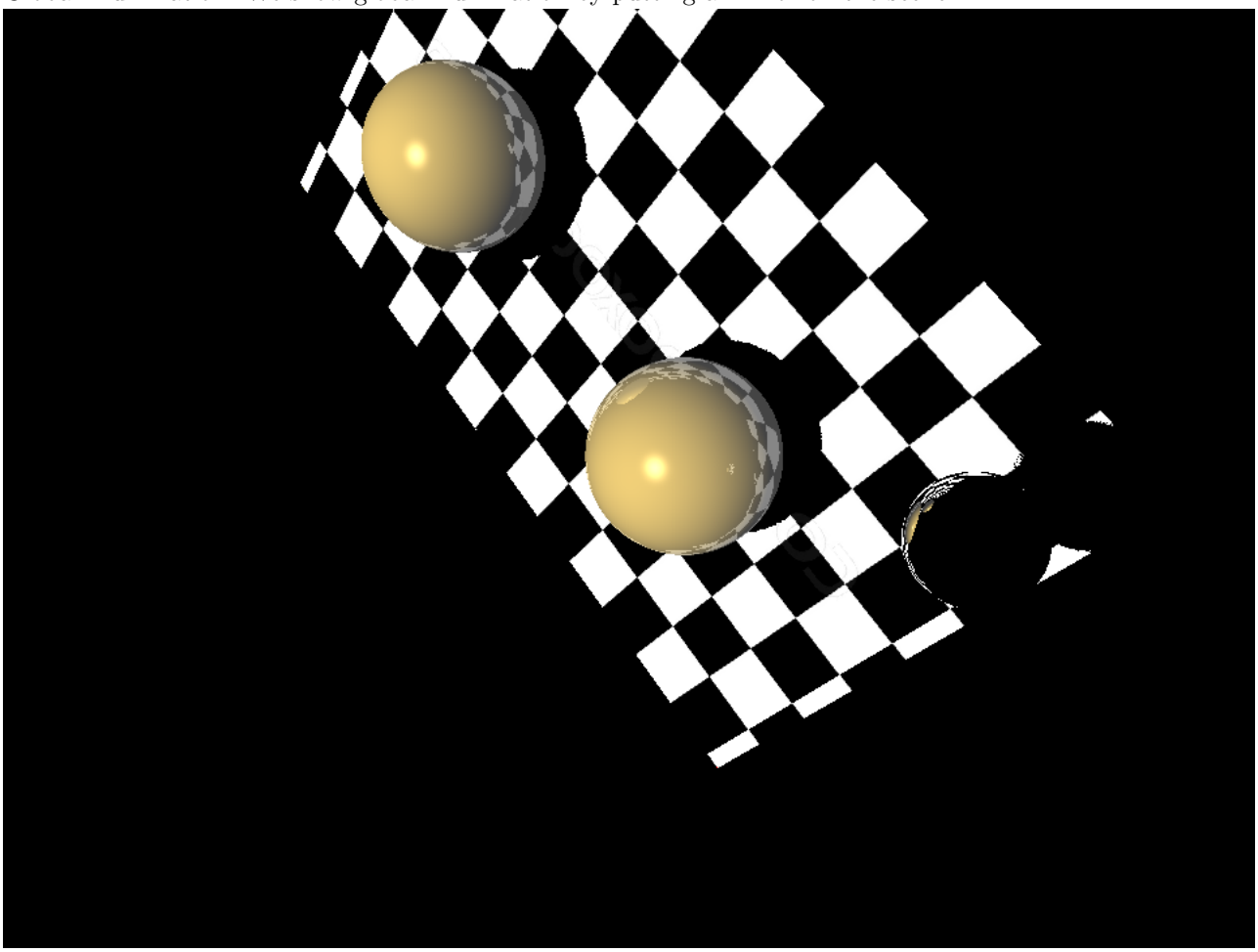


Now we look at Part b implementations. A lot of the pictures we show already includes a basic texture map.

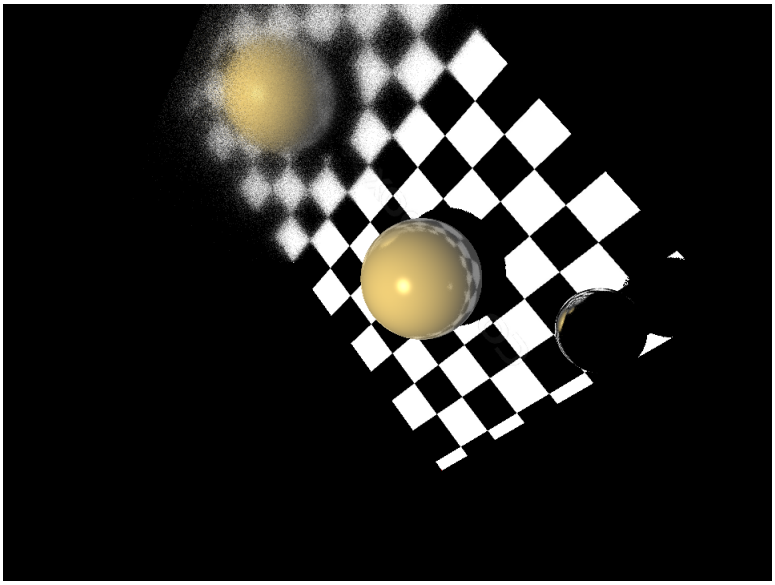
(a) Hard Shadow : refer hardshadow2, or turn on HARD_SHADOW flag and build yourself



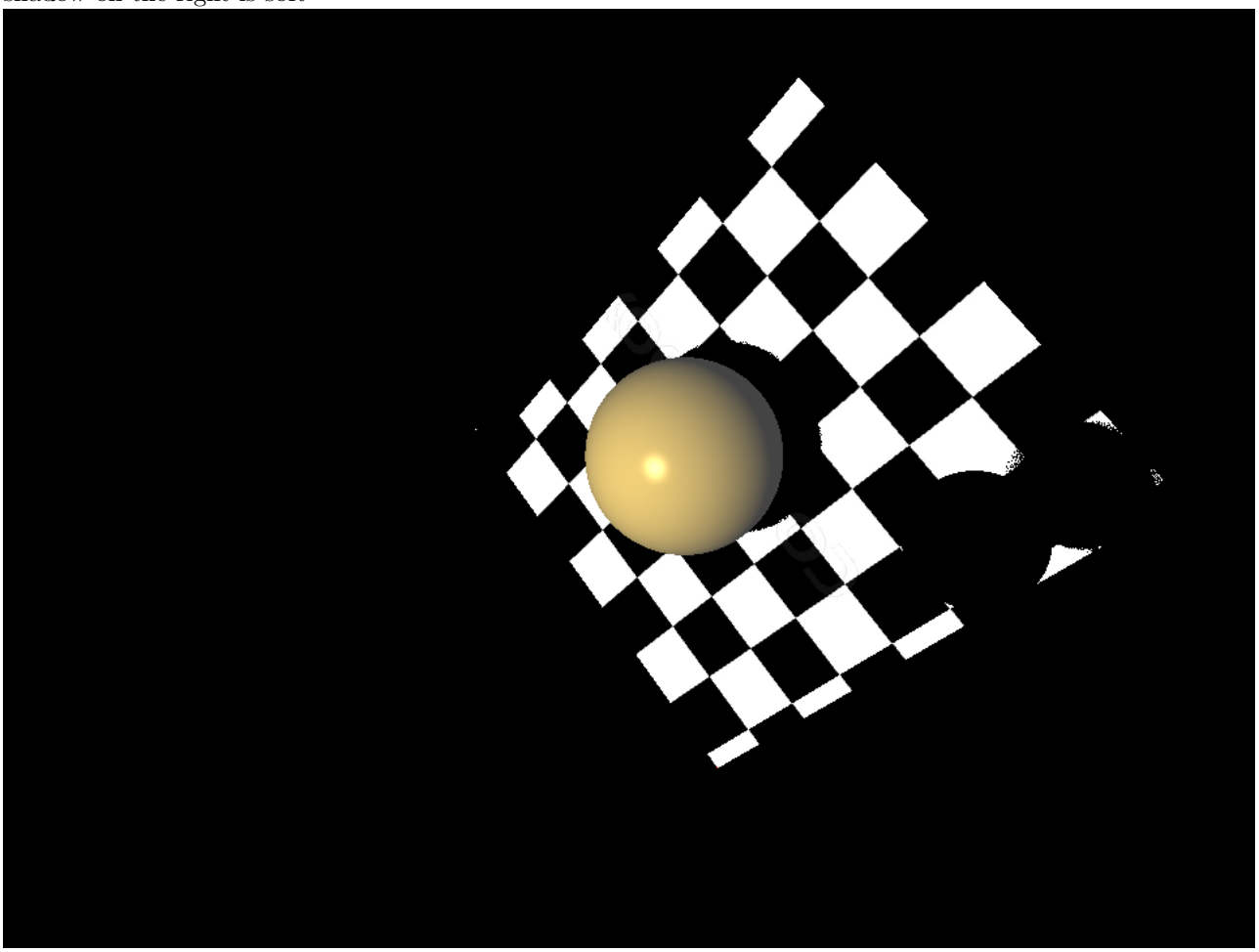
(b) Global Illumination: We show global illumination by putting a mirror on the scene.



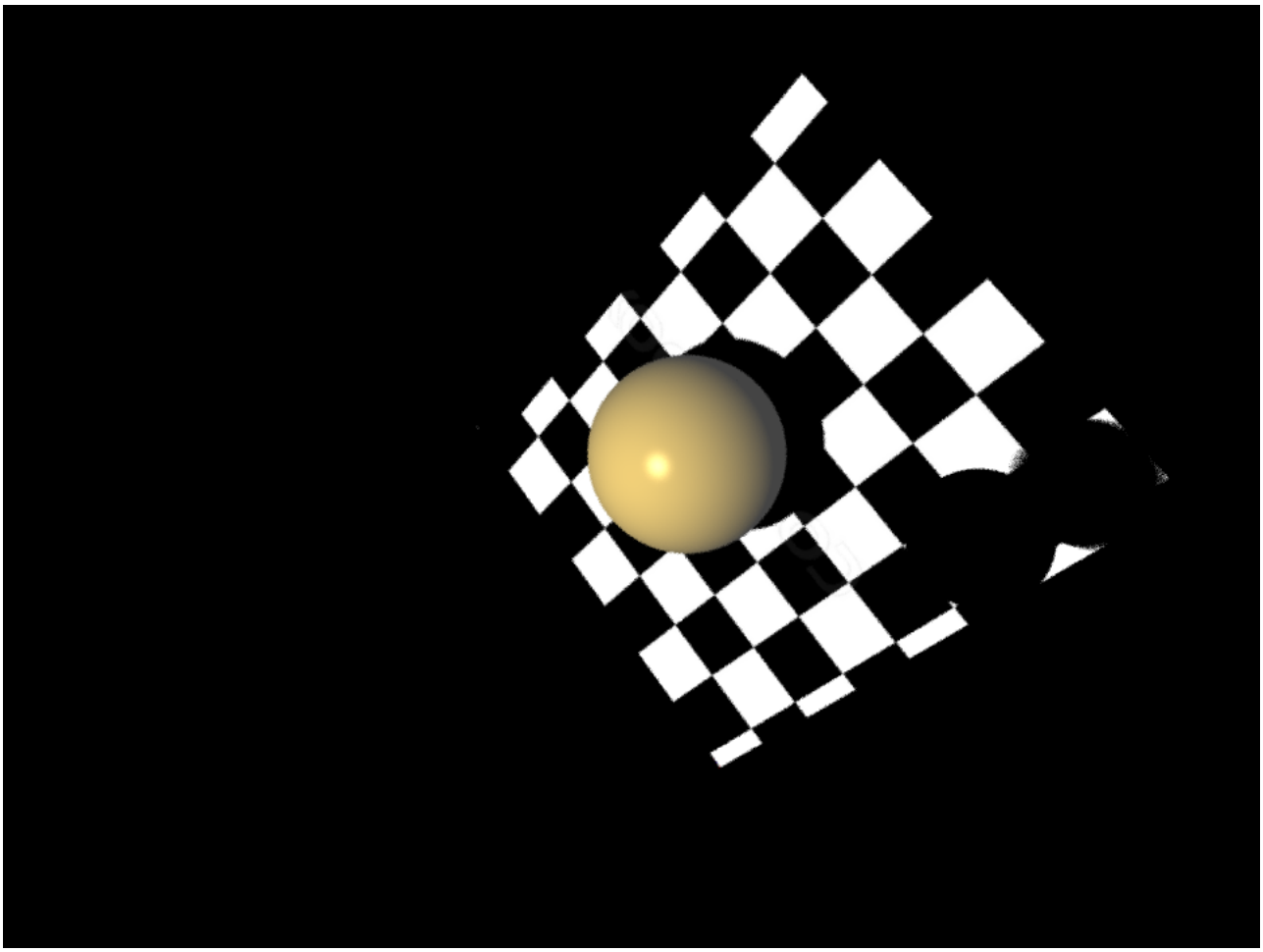
(c) Glossy Reflection: We Sampled from a normal distribution on incident reflection to achieve this effect:



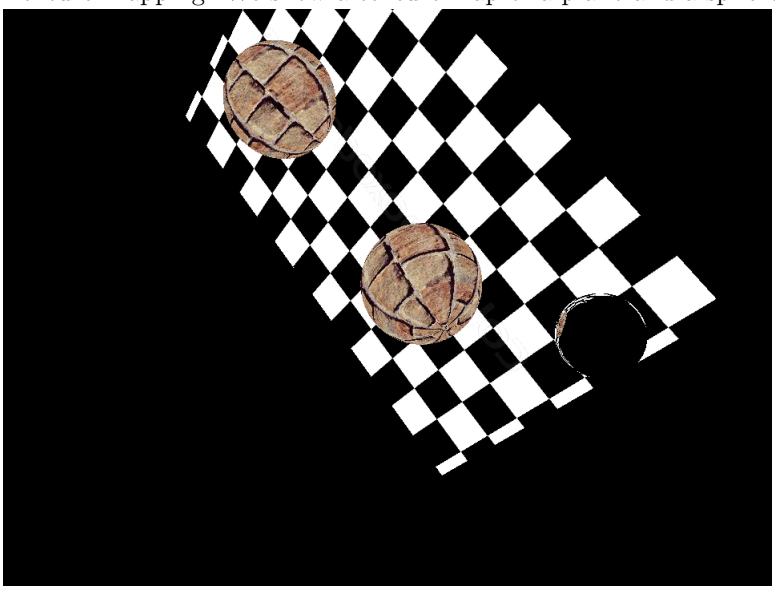
(d) Soft Shadows : We Sampled from a gaussian distribution on shadow checking to achieve this effect: Notice the shadow on the right is soft



(e) Anti Aliasing: We used Jitter method for AA. Here is a comparasion from last image: Notice that shadow is smoother. We can make it even better if we have more samples, this is just a showcase thats our implmentation works



(f) Texture Mapping: We show a texture map of a plane and a sphere:



(g) Environment Mapping: We show an environment map with reflection by a sphere from 2 different angles: