CSC418 A3 Report

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- read me first please:

1. Some feature takes a long time to produce(i.e. soft-shadow, anti-alias) even in a low resolution(320x240) due to ray sampling, so we added some flags so that you can turn on/off the features, we strongly recommend NOT turning on more than TWO features at the same time.
2. To run the code after making file, type the command like below in terminal:
   ./raytracer [width height] [-s -g -e -a -d -t]
   2.1. where **-s** for soft-shadow, **-g** for glossy reflection, **-e** for environment mapping, **-a** for anti-alias, **-d** for depth of field and **-t** for texture mapping.
   2.2 if no resolution specified, image size is set by 320x240 by default.
   2.3 the output images are saved under the folder ‘results’.

- overall submission:

All the files included in the starter code plus folder containing the results and images needed for environment mapping.

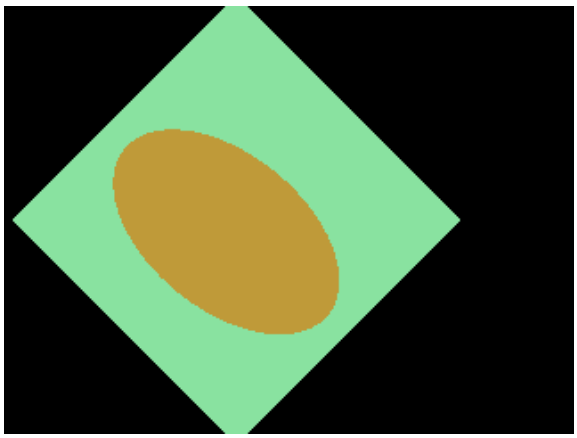
- the code, and the file structure of the submission:

```
./raytracer
    all files contained originally in the starter code
    /results
        /partA
        /soft-shadow
        /anti-alias
        /Depth-of-Field
        /environment-mapping
        /glossy
        /origin
    /textures
         images needed for environment mapping
```

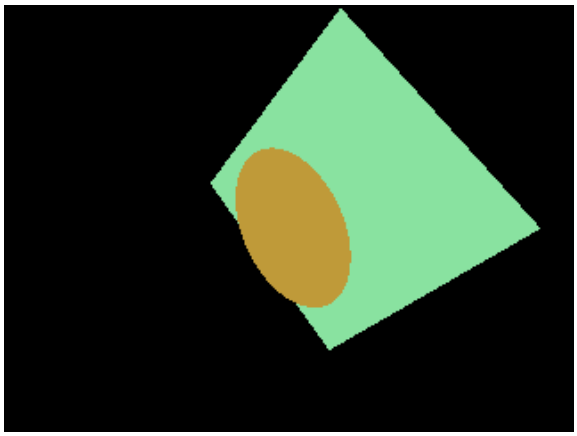
- features implemented & external resources:

Part A:

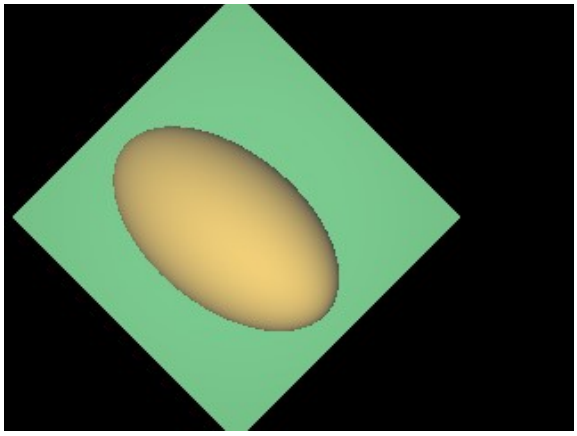
sig1



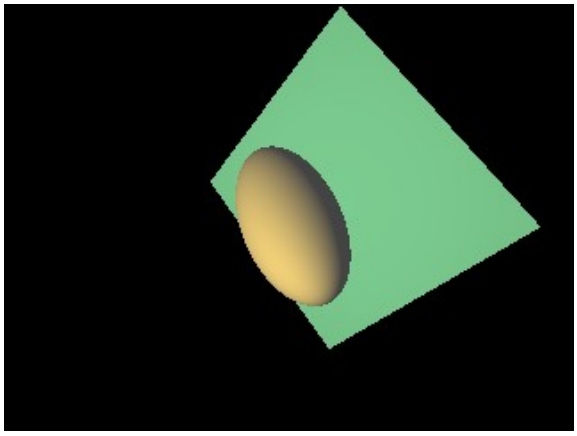
sig2



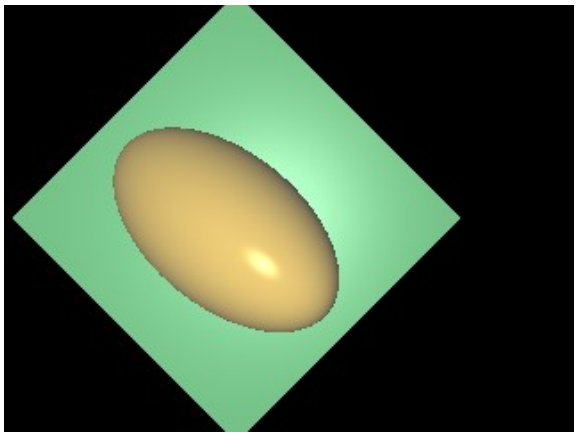
diffuse1



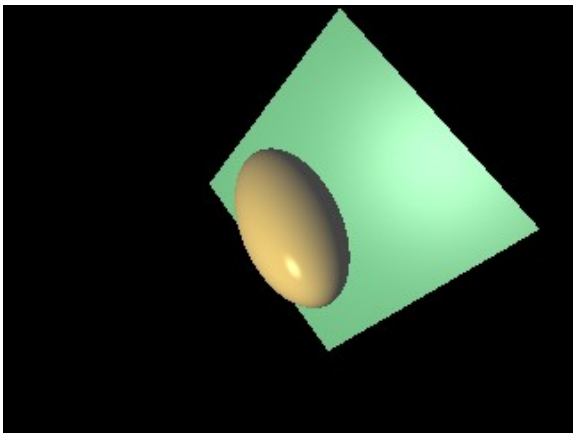
diffuse2



phong1

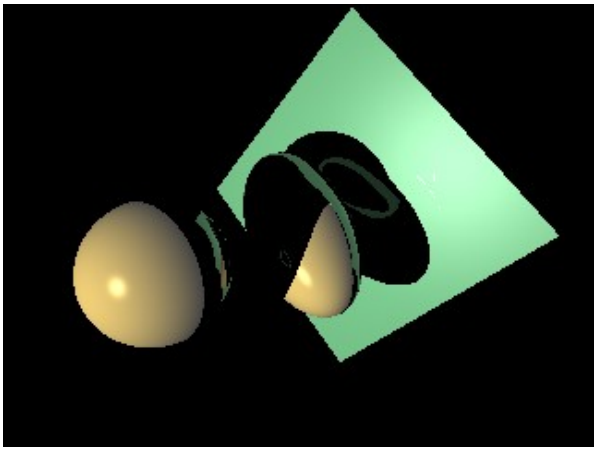


phong2

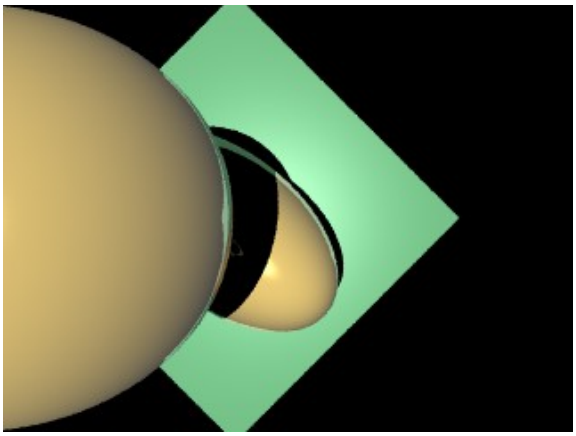


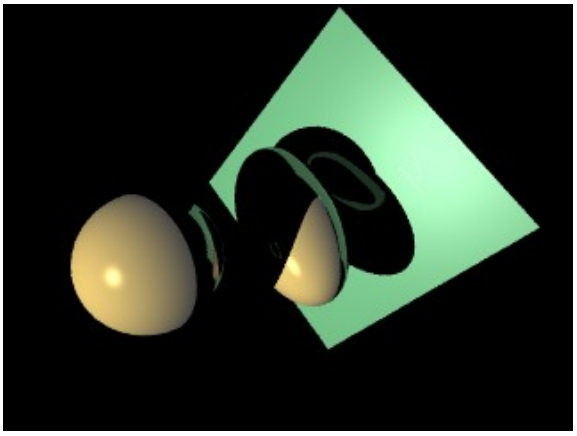
Part B:

0. Advanced ray-tracing: (recursive ray tracing and hard shadows)
by typing *./raytracer*

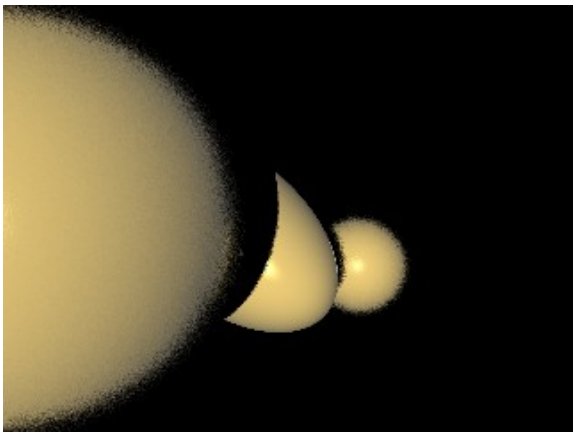


1. Anti-aliasing: *./raytracer -a*

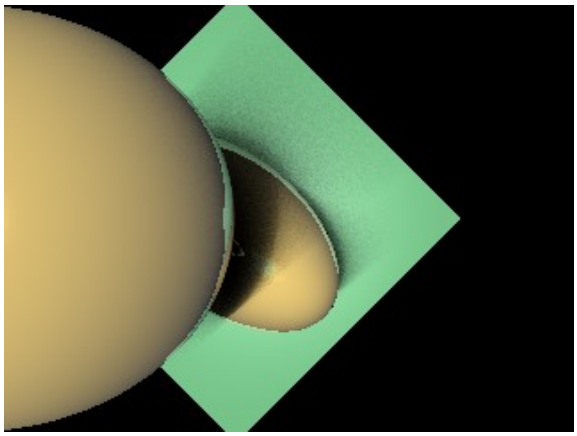


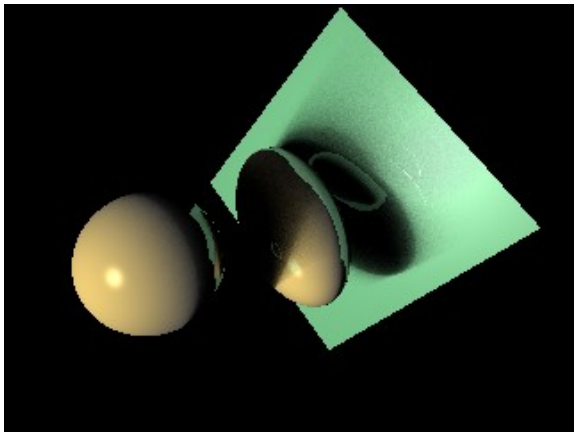


2. Depth of filed: *./raytracer -d*

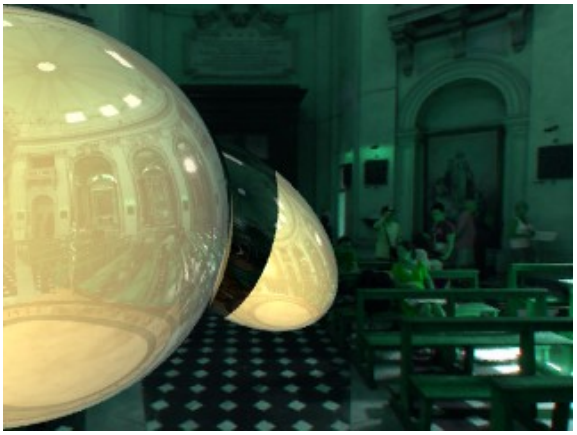


3. soft shadows: *./raytracer -s*





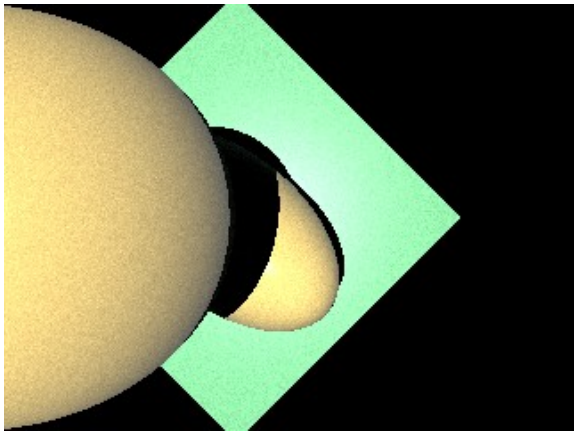
4. Environment mapping: *./raytracer -e*

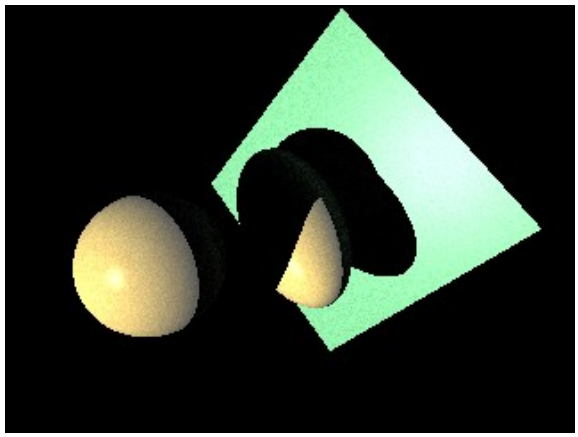


Note: in order to produce environment mapping, we used the environment images from the Internet.

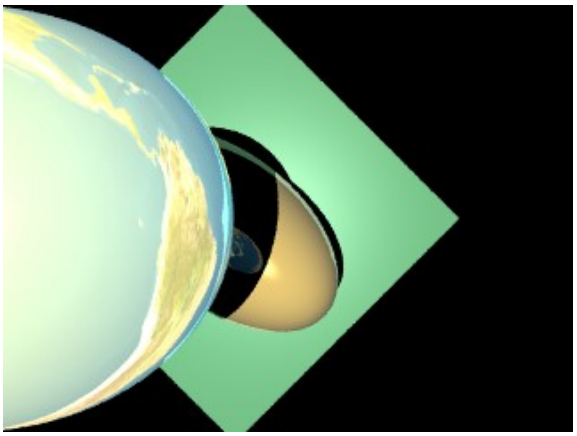
5. Glossy reflection: *./raytracer -g*

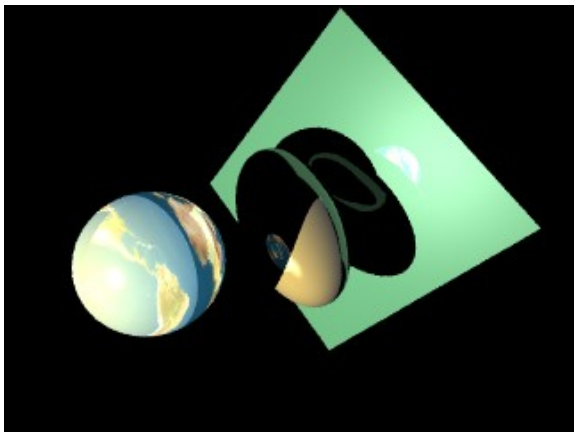
(surface the objects becomes rough)





6. Texture mapping: *./raytracer -t*





- the role of each menber:

Yue Li:

implemented Part A, hard shadow, anti-alias, Depth-of-field, soft shadow, glossy reflection, write the report.

Tianshu Zhu:

implemented hard shadow, recursive reflection, texture and environment mapping, command flags.