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Compiler / Environment / Platform Used: GCC, macOS, Visual Studio Code (VS Code)
Number of late days used: 3

Fully Implemented:

1. Ray::Camera::getRay
2. Ray::ShapeList::processFirstIntersection
3. Ray::Sphere::processFirstInersection
4. Ray::Triangle::processFirstIntersection
5. Ray::PointLight::getAmbient, Ray::SpotLight::getAmbient, Ray::DirectionalLight::getAmbient
6. Ray::PointLight::getDiffuse, Ray::SpotLight::getDiffuse, Ray::DirectionalLight::getDiffuse
7. Ray::PointLight::getSpecular, Ray::SpotLight::getSpecular, Ray::DirectionalLight::getSpecular
8. Ray::PointLight::isInShadow, Ray::SpotLight::isInShadow, Ray::DirectionalLight::isInShadow
9. Ray::Scene::getColor (All modifications)
10. Ray::StaticAffineShape::init
11. RayScene::Reflect
12. Ray::Scene::Refract
13. Ray::SphereLight::transparency
14. Ray::Sphere::processAllIntersections
15. Ray::PointLight::transparency, Ray::SpotLight::transparency, Ray::DirectionalLight::transparency
16. Ray::Shape::updateBoundingBox (`Ray/*.todo.cpp`)
17. Ray::AffineShape::updateBoundingBox
18. Ray::ShapeList::updateBoundingBox
19. Ray::Triangle::processFirstIntersection

Partially Implemented:

1. Accelerated Ray-Tracing

Left Un-implemented:

1. All remaining functions

Other:

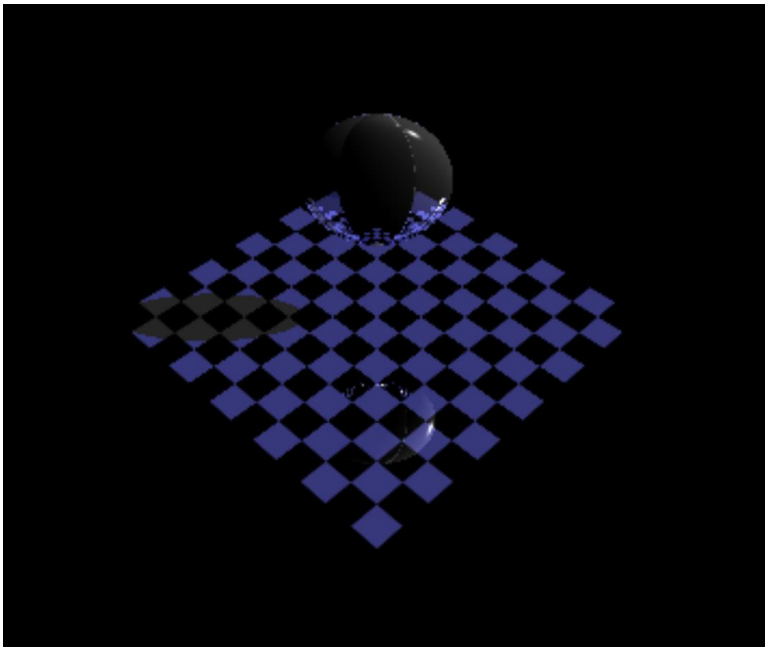
1. Generate a 3D scene and save it as a .ray file. The scene should have both spheres and triangles, should have all three types of light sources in it, and

should contain at least one primitive with a transparent material. (Static3D/**art.ray**)

2. Image for art contest (/agupt110_HTML/agupt110.art.Submission1.jpeg).
3. .ray file for art contest (/Assignments/Static3D/art.ray)

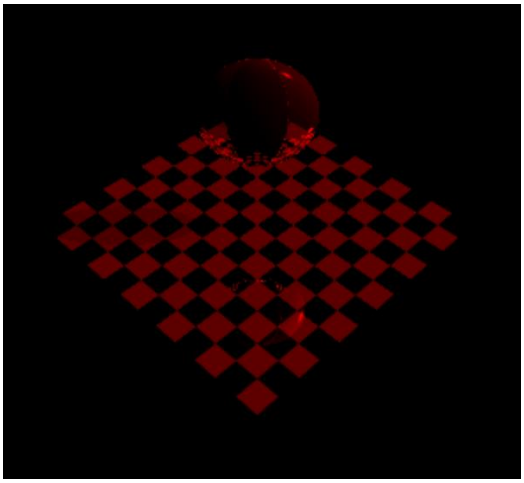
Test Images:

I get the desired results for sample images on the course website for RaySphere::processFirstIntersection to GetColor. However, there must be an inconsistency in the implementation of transparency which produces the following image for test.directional.ray.



I am getting a segmentation fault for test.point.ray, test.spot.ray, test.sphere.ray for some reason, but I have implemented the *todo.cpp files for these light sources correctly (I couldn't debug in time).

Art Contest:



Name: Satan’s Eye

To generate the image:
I changed test.directional.ray to support red color instead of purple color. The .ray file used to generate the image is Static3D/selftest.ray.

.ray file for art contest (meets the requirements for shapes, lighting, and transparency primitive): Static3D/art.ray

```
#camera  0 10 10  0 -0.707107 -0.707107  0 0.707107 -0.707107  0.523

#light_dir  0.5 0.5 0.5  1 1 1  1 1 1  -0.707107 -0.707107 0

#light_point  0.3 0.3 0.3  1 1 1  1 1 1  2 2 2  1 0.1 0.05

#shader  basic.vs basic.fs

#texture  wood_texture.jpg

#material  0.1 0.1 0.1  0.3 0.3 0.3  0.6 0.6 0.6  1.0 1.0 1.0  0.0 0.0 0.0  1.5  0  !string!

#material  0.1 0.1 0.1  0.3 0.3 0.3  0.6 0.6 0.6  1.0 1.0 1.0  0.5 0.5 0.5  1.5  0  !string!

#vertex  0 0 0  0 1 0  0 0

#shape_sphere  1  0 0 0  1

#shape_triangle  0 1 2
#vertex  1 0 0  0 1 0  1 0
#vertex  0 1 0  0 1 0  0 1
#vertex  0 0 1  0 1 0  1 1
```

```
#ray_file  _another_scene.ray
#ray_file  _additional_objects.ray

#static_affine  0.5 0 0 0 0 1 0 0 0 0 0.5 0 2 2 3 1
  #ray_file_instance  0

#dynamic_affine  rotation_parameter
  #ray_file_instance  1

#shape_list_begin
  #shape_box  1  3 3 3  1 1 1
  #shape_cone  2  1 1 1  0.5 2
#shape_list_end

#shape_intersection
  #shape_sphere  0  0 0 0  1
  #shape_cylinder  2  0 0 0  0.7 1.5
```