

Study Guide

S18 CSC 473 Midterm 1

Example questions and topic areas for midterm 1

- 1) Short answer questions about aspects of ray tracing and rendering (especially in contrast with real-time rendering using OpenGL)
- 2) Short answer questions about C++, about references/pointers, rule-of-three, SRP
- 3) ray generation questions (ie given a camera defined by specific povray specifications, what would the ray be for a given pixel, etc.)
- 4) Reflect the incoming ray $(-3, -4, 0)$ around the normal $(0, 1, 0)$
(watch out for normalization)
- 5) Refract the incoming ray $(-3, -4, 0)$ around the normal $(0, 1, 0)$, coming from air and entering glass with ior 1.67
(watch out for normalization)
- 6) Intersect the ray $(1,1,1)+t(-1,-1,-1)$ with a sphere centered at the origin with a radius of 1.
- 7) Given a light with the following $\{r, g, b\} = \{1.0, 1.0, 1.0\}$, positioned at $\{6,8,0\}$, and an object intersection at $\{0, 0, 0\}$ with a normal of $\{0, 1, 0\}$ for a ray with direction $\{4, -3, 0\}$ what is the Blinn-Phong illumination at that point, assuming the object has the following povray terms:

```
pigment { color rgb <0.2, 0.8, 0.2>}  
finish{ ambient 0.1 diffuse 0.4 specular 0.5 roughness 0.5}
```

Show your work!

- 8) What are the barycentric coordinates and ray parameter where the ray $(1,1,1)+t(-1,-1,-1)$ hits the triangle with vertices $(1,0,0)$, $(0, 1, 0)$, and $(0, 0, 1)$?
- 9) Intersect the ray $(1,1,1)+t(-1,-1,-1)$ with the plane defined by normal $= (0, 1, 0)$, $d = 0$.