Perspective correct interpolation
Perspective correct interpolation

• In assignment 1, we found barycentric coordinates in 2D screen space
• but not the correct object space barycentric coords
• these coordinates were okay for z-buffer test
Perspective correct interpolation

Using screen space bary. coords. looks wrong for textures

Heckbert and Morton, 1990
Perspective correct interpolation

Using screen space bary. coords. looks wrong for textures

http://en.wikipedia.org/wiki/Texture_mapping#Perspective_correctness
Environment mapping
Environment Mapping

Use a texture for the distant environment to simulate the effect of ray tracing more cheaply.
Environment Mapping

Create the effect of a mirror with two-pass rendering

1. First pass: render the scene from the perspective of the mirror
2. Second pass: render from original pov; use the first image as a texture for the mirror
Sphere Mapping

- Project objects in the environment onto sphere centered at eye
- Unwrap and store as texture
- Use reflection direction to lookup texture value

How is environment mapping different from ray tracing?
- Typically only the direction of the reflection vector is used to look up the texture value—this doesn’t reproduce the true intersection of the reflected ray with the object it hits.
- Note: realism of environment map degrades as model is displaced from where the textures were generated.
Cube Mapping

- Compute six projections, one for each wall
- Store as texture
- Use reflection direction to lookup texture value
Different environment maps

Blinn/Newell latitude mapping

OpenGL spherical mapping

Cube mapping

www.reindelsoftware.com
Shadow Mapping

first pass from light’s perspective

1. render scene from pov of light and store z-buffer in a texture

2. render scene from desired pov, and test pixel against light’s z-buffer