

Question Set 12

CS 420

Chapter 15

1. In GLSL, what does `texture2D()` do, and what does a `sampler2D` variable represent?
2. Over what values do the x- and y-values of a texture coordinate range? For a given piece of geometry, *will* the x- and y-values of a texture coordinate range over these values?
3. Modify the following fragment shader to reflect the texture across the line $x = 0.5$ and to set any fragments mapped to the upper right quarter of the texture to the color red.

```
#extension GL_EXT_gpu_shader4 : enable
uniform sampler2D uTexUnit;

varying vec2 vTexCoord;
varying vec3 vColor;

void main(void) {
    vec4 texColor = texture2D(uTexUnit, vTexCoord);

    gl_FragColor = texColor;
}
```

4. Describe normal mapping in terms of how it's done and what it accomplishes visually.
5. Describe environment cube mapping. Is it used with static or dynamic background scenery?
6. Describe an example of the use of projector texture mapping. How does it differ from standard texture mapping?
7. Describe dynamic reflection mapping. Is it the dynamic version of what other type of mapping?
8. Describe how shadow mapping is accomplished. Specifically, how is a shadow map constructed? How is a shadow map value selected and used when a scene is actually rendered? What does shadow mapping share with projector texture mapping?