50.017

Supplementary Tutorial

on OpenGL

OpenGL Hints

Vertex Normal vs Face Normal

Per-vertex normal: each vertex of a face has a different normal (for a sphere it means all normals point outward from its center)

```
glBegin(GL_TRIANGLES);
        glNormal3f(0.0f, 0.0f, 0.0f);
        glVertex3f(0.0f, 0.0f, 0.0f);
        glNormal3f(0.0f, 1.0f, 0.0f);
        glVertex3f(0.0f, 1.0f, 0.0f);
        glNormal3f(1.0f, 0.0f, 0.0f);
        glVertex3f(1.0f, 0.0f, 0.0f);

        glNormal3f(0.0f, 1.0f, 0.0f);
        glVertex3f(0.0f, 1.0f, 0.0f);
        glNormal3f(1.0f, 1.0f, 0.0f);
        glVertex3f(1.0f, 1.0f, 0.0f);
        glNormal3f(1.0f, 0.0f, 0.0f);
        glVertex3f(1.0f, 0.0f, 0.0f);
glEnd();
```

OpenGL Hints

Vertex Normal vs Face Normal

Per-face normal: each vertex gets the same normal value

```
glBegin(GL_TRIANGLES);
        glNormal3f(0.0f, 0.0f, 1.0f);
        glVertex3f(0.0f, 0.0f, 0.0f);
        glVertex3f(0.0f, 1.0f, 0.0f);
        glVertex3f(1.0f, 0.0f, 0.0f);

        glNormal3f(0.0f, 1.0f, 0.0f);
        glVertex3f(0.0f, 1.0f, 0.0f);
        glVertex3f(1.0f, 1.0f, 0.0f);
        glVertex3f(1.0f, 0.0f, 0.0f);
glEnd();
```

OpenGL Hints

Vertex Normal vs Face Normal

Which one is correct?

OpenGL Hints

Vertex Normal vs Face Normal

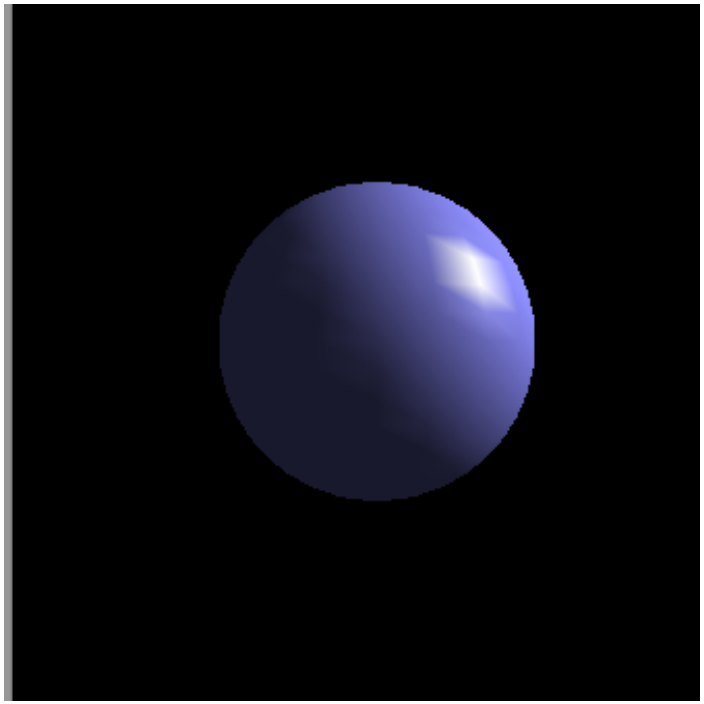
Which one is correct?

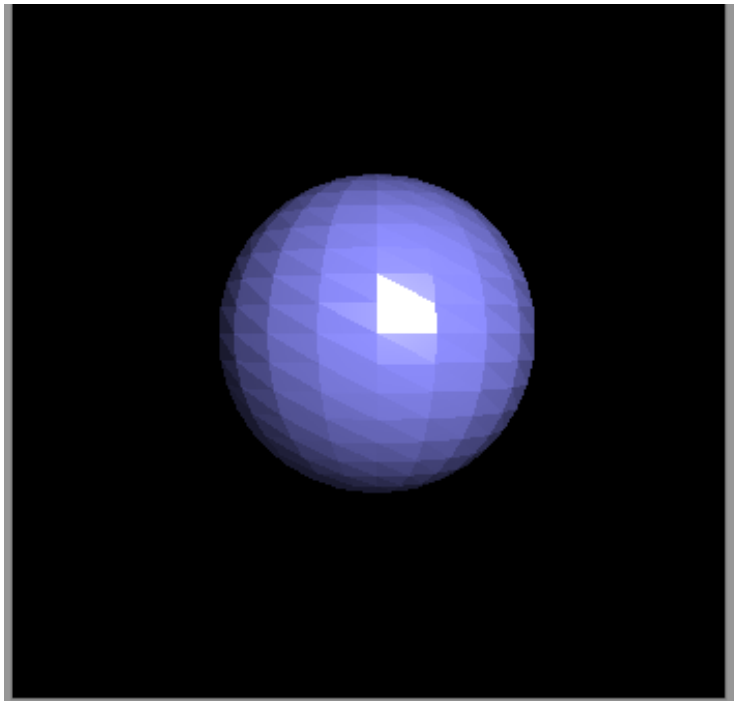
It depends!

OpenGL Hints

Vertex Normal vs Face Normal

Sphere vs Cube





OpenGL Hints

Vertex Normal vs Face Normal

Sphere vs Cube

Try Cube by yourself ?