Lectures
Glu Object Case Study

By
Tom Duff
Pixar Animation Studios
Emeryville, California
and
George Ledin Jr
Sonoma State University
Rohnert Park, California

Settings used for this case study

- When rendering the objects, depth-buffer is turned on to show the front view only.
  - glEnable(GL_DEPTH_TEST);
- When rendering solid objects, one light is enabled so that the shape of objects is highlighted.
  - The code to turn the light on:

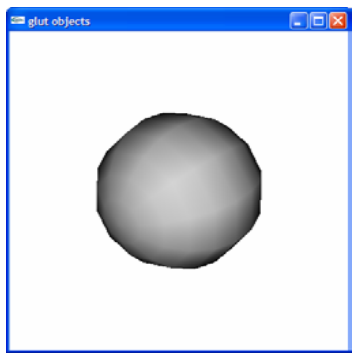
```
glEnable(GL_LIGHTING);          // enable the light
glEnable(GL_LIGHT0);            // turn on one light, light0
```

  Since we did not specify the light parameters, the OpenGL default parameters are used. In OpenGL default setting, the light0 is shining in –z direction.
- Different gluLookAt are used to adjust the camera to view the object.
- Different glOrtho values are used to adjust the size of object with respect to viewport.

Glu Objects - Sphere

- void gluSphere(GLUquadricObj **qobj*, GLdouble *radius*, GLint *slices*, GLint *stacks*)
- *qobj*
  - Specifies the quadrics object (created with **gluNewQuadric**).
- *radius*
  - Specifies the radius of the sphere.
- *slices*
  - Specifies the number of subdivisions around the *z* axis (similar to lines of longitude).
- *stacks*
  - Specifies the number of subdivisions along the *z* axis (similar to lines of latitude).
- **Sample Code:**

```
GLUquadricObj *qobj = gluNewQuadric();
gluLookAt(0,0,0, 0,0,-1, 0,1,0);
qobj = gluNewQuadric();
gluQuadricDrawStyle(qobj, GLU_FILL);
gluSphere(qobj, 2.0,12,12);
```



Glu Objects - Cylinder

- void **gluCylinder**(GLUquadricObj **qobj*, GLdouble *baseRadius*, GLdouble *topRadius*, GLdouble *height*, GLint *slices*, GLint *stacks*)

- *qobj*
  - Specifies the quadrics object (created with **gluNewQuadric**).

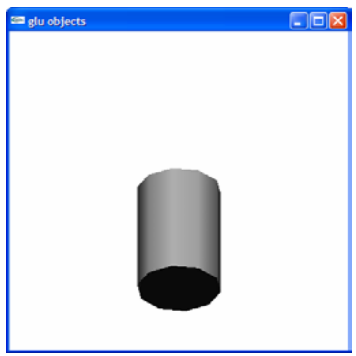
- *baseRadius*
  - Specifies the radius of the cylinder at *z* = 0.

- *topRadius*
  - Specifies the radius of the cylinder at *z* = *height*.

- *height*
  - Specifies the height of the cylinder.

- *slices*
  - Specifies the number of subdivisions around the *z* axis.

- *stacks*
  - Specifies the number of subdivisions along the *z* axis.



- **Sample Code:**

```
GLUquadricObj *qobj = gluNewQuadric();
gluLookAt(1,1,1, 0,0,0, 0,0,-1);
qobj = gluNewQuadric();
gluQuadricDrawStyle(qobj, GLU_FILL);
gluCylinder(qobj,1,1,3,10,10);
```

Glu Objects - Disk

- void **gluDisk**(GLUquadricObj **qobj*, GLdouble *innerRadius*, GLdouble *outerRadius*, GLint *slices*, GLint *loops*)

- *qobj*
  - Specifies the quadrics object (created with **gluNewQuadric**).

- *innerRadius*
  - Specifies the inner radius of the disk (may be 0).

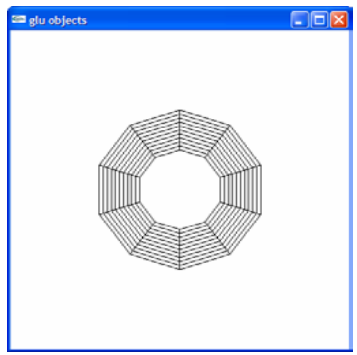
- *outerRadius*
  - Specifies the outer radius of the disk.

- *slices*
  - Specifies the number of subdivisions around the *z* axis.

- *loops*
  - Specifies the number of concentric rings about the origin into which the disk is subdivided.

- **Sample Code:**

```
GLUquadricObj *qobj = gluNewQuadric();
gluLookAt(1,1,1, 0,0,0, 0,0,-1);
qobj = gluNewQuadric();
gluQuadricDrawStyle(qobj, GLU_FILL);
gluDisk(qobj, 1,2,10,10);
```



Glu Objects – Partial Disk

- void gluPartialDisk(GLUquadricObj **qobj*, GLdouble *innerRadius*, GLdouble *outerRadius*, GLint *slices*, GLint *loops*, GLdouble *startAngle*, GLdouble *sweepAngle*);

- *qobj*
  - A quadric object (created with **gluNewQuadric**).

- *innerRadius*
  - The inner radius of the partial disk (can be zero).

- *outerRadius*
  - The outer radius of the partial disk.

- *slices*
  - The number of subdivisions around the z-axis.

- *loops*
  - The number of concentric rings about the origin into which the partial disk is subdivided.

- *startAngle*
  - The starting angle, in degrees, of the disk portion.

- *sweepAngle*
  - The sweep angle, in degrees, of the disk portion.

- **Sample Code:**

```
GLUquadricObj *qobj = gluNewQuadric();
gluLookAt(1,1,1, 0,0,0, 0,0,-1);
qobj = gluNewQuadric();
gluQuadricDrawStyle(qobj, GLU_FILL);
gluPartialDisk(qobj, 1,3,10,10,0,60);
```