Project Objectives:
In this project, you will learn about (1) the creation of more complex primitives, (2) shading and lighting and (3) information visualization in the context of the FcgNode data structure.

Project Description:
This project asks you to implement a set of simple 3D shapes that are pervasively used in CAD applications. Subsequently, you will render these models with proper lighting and shading. The final part asks you to provide information visualization capabilities that will be used to render the data structure used to store your fcg models.

Part 1:
(a) Modify your parser to support the extended ".fcg" file format primitives (Version 1.3)
   a. Add CUBE primitive
   b. Add CYLINDER primitive
   c. Add CONE primitive
   d. Add SPHERE primitive
(b) Modify the parser to support material properties.

Part 2:
(c) Implement a visualization function for surface (vertex) normals. The user has to be able to toggle the normal display on and off
(d) Support different shading options (Flat and Smooth)
(e) Implement three light sources with different properties. Light properties and placement have to be adjustable at run-time through your GUI

Part 3:
(f) Develop a scene graph visualization tool that renders the structure of your FcgNodes, i.e. internal data structure. Starting from the root node, construct a tree that uses different geometric primitives to distinguish between FcgPrimitives, FcgTransformations, etc.
(g) Support two adjacent windows, one showing your scene graph and one showing the actual model.

Bonus Credit
(h) Allow the user to select a node in the scene graph using the mouse, and highlight the corresponding geometry in the model view.

As before:
• Allow the user to resize the top-level window interactively (preserve aspect ratio and keep your images in the same relative position).
• Toggle display modes (solid/wireframe/points) through a GUI interface (GLUT/GLUI)
• Support keyboard and mouse events that allow the user to translate, rotate and scale the model by manipulating the 3D viewing area directly with the mouse.

HAVE FUN !!!