OpenGL Labs

CS 320

Feb 24, 2003

Color Cube

Open a new OpenGL project in Visual C. Go to the course web site, download `cube.c` and do the following:

1. Make sure your display settings are set to TrueColor. Compile and run the program. Use the x, y, and z keys to change the axis of rotation. The escape key will terminate the program. Note the smoothness of the color transitions on the cube. Do the rotation axes appear to be fixed or do they shift about?

2. Set the display setting to 256 colors and re-run the program. Describe the changes in the cube's color transitions. What is going on? Set the frame buffer depth to a reasonable value when you're finished.

3. Near the top of the source code, comment-out the preprocessor definition of `DEPTH` Compile and run. Describe what happens. What is going on? Restore the definition when you are finished.

4. (Don't try this on an empty stomach.) Change the value of `zNear` in the two `glOrtho()` calls in `myReshape()` to `0.0`. Predict the result. Was your prediction correct?

ViewPorts

Open a new OpenGL project in Visual C. Go to the course web site, download `viewport.c` and do the following (**don't** run the program until you're told to do so):

1. Study the source code to determine how the mouse controls the two state variables `maintainAspectRatio` and `realtimeRedraw`.

2. The `list` display list created in `main()` stores the vertices of the two polygons in a list so that the list call be called later (in `display` to speed rendering. Note that the display list complete covers the clipping region.

3. Look at `display()` and note how the calls to `glViewport()` are being used to change the mapping from world coordinates to window coordinates. Execute the code "by hand" to predict what will be displayed when you run the program.

4. Run the program. Was your display prediction correct? Experiment with resizing the window: Try both aspect ratio modes and observe the differences. What does `realtimeRedraw` do, exactly? Explain what's going on with it. Tap the escape key to exit.

5. Under what conditions is `reshape()` called?

6. Assuming that `maintainAspectRatio` is true, explain how `reshape()` works.

7. Look at `idle()` to see how text is displayed. Suggest a better way.