



Series 3

Tutorial) Familiarize with the examples provided in the FreeGlut tutorial: focus on the source code, the project structure, and the way external dependencies are managed/included. Feel free to reuse and adapt such examples to fit into your exercises and course project.

1) Write a method that draws a 3D cube made of triangles. The cube object coordinates must be centered at the cube's barycenter. Change the cube position by modifying the current modelview matrix through OpenGL.

The method will take the length of the cube edge as parameter and compute its vertices accordingly. Each face will also have a different color.

- Render an animated cube at the center of the screen, spinning around the XY axes.
- Switching mode: by hitting the spacebar, stop the automatic spinning and let the user manually rotate the cube around XY by pressing the keyboard arrow keys. By hitting the spacebar again, the cube will go back to the automatic spinning mode.
- By pressing the "R" key (i.e., "randomize"), update the colors on the cube faces with new random tones.



2) Build a tower by using a stack of (at least) three cubes, one on top of the other (reuse and adapt the code from the previous exercise as necessary). The cubes must be progressively smaller (use scaling) and inherit the transformations applied to the previous cubes. Each cube must also slowly rotate around its Y-axis. Rotations will sum up at each recursive iteration, like scaling.

Suggestion: start adding content to your graphics engine library by integrating/wrapping all the FreeGlut-related stuff. Think of your engine's main class (e.g., MyEngineCore class), responsible for creating/releasing the window and context, registering callbacks, cleaning buffers, swapping buffers, etc.