Due: 10/24 (11:59PM)

Requirements:

- Write an OpenGL program that features flying 3D teapots. Name your source code `hw2.cpp`. The program should meet the following requirements:
  - This program animates a flurry of 3D teapots flying towards the viewer.
  - Use *perspective projection* system.
  - First, create a large room with 5 walls in which the teapots navigate (See Fig. 1). The room must be deep enough to give a sense of depth from far plane to near plane.
  - Then, create $10 \sim 15$ teapots at random 3D locations inside the room. Also create light(s) at appropriate location(s) so that all the teapots in the room are clearly visible.
  - Each teapot should be assigned a distinct color (as in Fig. 1), and must be properly lit and shaded. The walls too must be properly lit and shaded. Use *smooth shading* to render the scene. (See Fig. 1).
  - Each teapot must be slowly spinning all the time (at a constant speed), using its own random rotation axis (must rotate in-place, meaning the rotation itself should not affect the teapot center position). Make sure each teapot uses a distinct rotation axis (see Fig. 1).
  - At the same time, each teapot must fly towards the near plane (at a constant speed), until it hits the near plane and then disappears.
  - Once a teapot disappears, it must immediately reappear from the far plane (at a random location on the far plane but within bounds of the room) then start flying/spinning again. Therefore, the number of teapots shown simultaneously on the screen should range between 10 and 15 at all times.
  - Each teapot must fly parallel to the line connecting the camera and the center of the far plane.
  - If the user presses `'q'` at any time, the program must terminate.
  - If the animation is too fast on your computer, slow it down to a speed where each teapot's movement is clearly recognizable.
  - Make sure there is no sudden jump or discontinuity in the animation. The whole sequence of transformations must be smooth and continuous.

What to submit:

- Submit only your **source files (.cpp, .h)** that are needed for compilation.

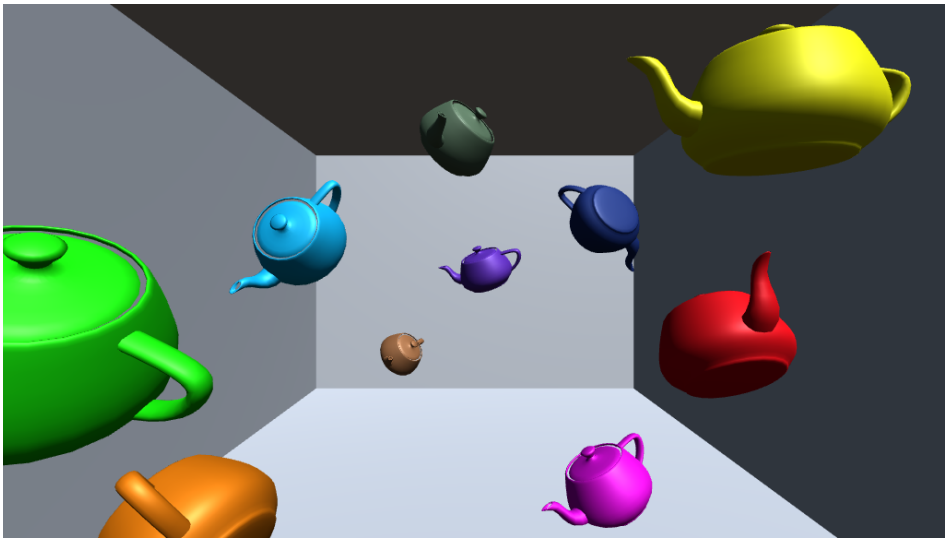

Figure 1: Flying/spinning teapots

How to submit:

- Use Canvas Assignment Submission system to submit your source files.

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- Use Canvas Assignment Submission system to submit your source files.
- Make sure to zip all your files into `hw2.zip`, then submit your `hw2.zip` as a single file.

Policy

- Do all the assignments on *Visual C++* using C++ and OpenGL.
- At the beginning of each file (.cpp, .h), provide comments specifying the author, date, and a brief description of the file.
- Source code (.cpp, .h) must contain enough comments here and there to make it easy to follow your code. Insufficient comments could lead to loss of points.
- Non-compilable program will get almost no credit (e.g., executable code not produced due to compile errors).
- Non-working program will get almost no credit (e.g., the executable is terminated immaturely due to run-time errors).

- Copying other's code is strictly prohibited. If identical (or nearly identical) submissions are found among students, every student involved will get automatic zero for the assignment. The same goes for copying existing code from online source.