Assignment 0426
This assignment seeks to have you round out your initial graphics pipeline implementation. There’s way more that you can do, of course, but this is what our allotted time allows.

Outcomes
This assignment will affect your proficiency measures for outcomes 1d, 1e, 2f, 2g, 2h, 3e, and 4a–4f.

Not for Submission
The lighting model that we have seen, plus a few more details, can be seen in Angel Chapter 5 and the orange book Chapter 9.
* The remaining material for the course can be found in Angel Chapter 6 Sections 6.3–6.7 (clipping) and Section 6.11 (hidden surface removal). To satisfy the outcomes pertaining to these topics (2f and 2g), just attend class on Thursday, April 19 and Tuesday, April 24.

For Submission
For the following tasks, keep building on homework/pipeline on your git repository. If you haven’t done so already, rename your files to better reflect what you have going now.

The New Normal
Add normal vectors to all of your shapes, particularly your sphere implementation. You may use any technique for generating them, including (correctly) using the functions given to you, writing code of your own, and manually specifying them (ouch, but if you insist on doing all that typing, then knock yourself out).

Light It Up
Implement a lighting model for your scene. At a minimum, you should use the model shown in class and designated in the reading. You can go beyond that if you wish (e.g., the UberLight model described in Chapter 12 of the orange book).

API for Your Thoughts
This task informs the proficiency measures for outcomes 1d and 1e. In any widely readable file format, answer the following questions:
1. Is the approach used by our graphics pipeline in representing objects (i.e., the Shapes module and the objectsToDraw array) closer to constructive solid geometry (CSG) or polygon meshes? Support your answer by citing specific similarities and differences between our code and the “pure” versions of these modeling techniques.
2. If forced to implement a “pure” version of either approach, which one would you personally prefer? Cite specific capabilities or scenarios that explain your answer.

Commit and push your work to your git repository under homework/pipeline.