

CS 371 – Fall 2020

Project 3

100 Points

Due: Thursday, 12/03/20 at 11:59PM in Canvas

To complete this assignment, you will need to render multiple objects, apply a lighting model to them, and then allow the camera to observe the scene from various viewpoints. Here are the specific requirements:

1. **Modeling:** Model a scene composed of at least 3 different 3D objects:
 - a. One object must be a regular polygon such as a cube, rectangular cuboid, etc.
 - b. Another object must be generated from a parametric representation and must have some curves in it – a sphere, cylinder, etc.
 - c. Another object must be loaded from a mesh file and must be a more complex objectYou are free to decide what these objects are and how they are placed in the scene. You must also decide the colors of the objects but there must be at least 3 different colors in the scene.
2. **Lighting:** You should provide a point light source in the scene that illuminates the objects. Your lighting model should be either the Phong model or the Phong-Blinn model, but it must use all three components – diffuse, specular and ambient. You will need to decide the material properties of each object in the scene. Ensure that you have a range of values for the shininess properties so we can see some interesting effects.
3. **Viewing:** You should allow the camera coordinates to be progressively changed so I can view the entire scene from different viewpoints. You may decide the interface to do this – buttons, arrow keys, etc. as long as a reasonably wide range of motion is allowed. Note that the light source is part of the scene. You will need to ensure that the clipping volume is appropriately set for the range of motion you are permitting.

This project specification gives a considerable amount of freedom to you, as long as you meet the above requirements. If you are concerned about whether your interpretation makes the problem too simple, or too difficult, or you need further clarification of specific requirements, please do clarify with me!

Note:

- As usual, you should modularize your code using other methods.
- Your program must have a substantial introductory documentation block. By reading that I should learn:
 - **How you modeled each object**
 - **What the material properties of each object are trying to capture**
 - **What specific lighting model you used, and how you computed the normal vectors for objects**
 - **Where the initial position of light and camera are**
 - **How, and to what extent, the camera can be moved**
- Each method in your program should have an introductory documentation block that clearly and accurately describes its role in the program
- Make sure that your program's internal logic is self-documenting through the judicious use of meaningful variable names and indentation. Use underscores or a mix of upper and lower case to achieve this self-documenting style, e.g., `sweep_angle` or `sweepAngle`

- Please indent your code correctly

Submission

To complete this assignment, simply submit your HTML and Javascript file, zipped up in a single folder, to the Canvas submission folder **Project 3** by the deadline specified. The **Common** files should not be submitted; instead, expect them to be in a sibling directory to your unzipped folder.