Project 3 - Shading

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What's implemented?

All requirements implemented. Simple lighting and shading (Blinn shading) for an object have been implemented with functionalities to rotate & zoom the object and rotate the light around the object (using two angles).

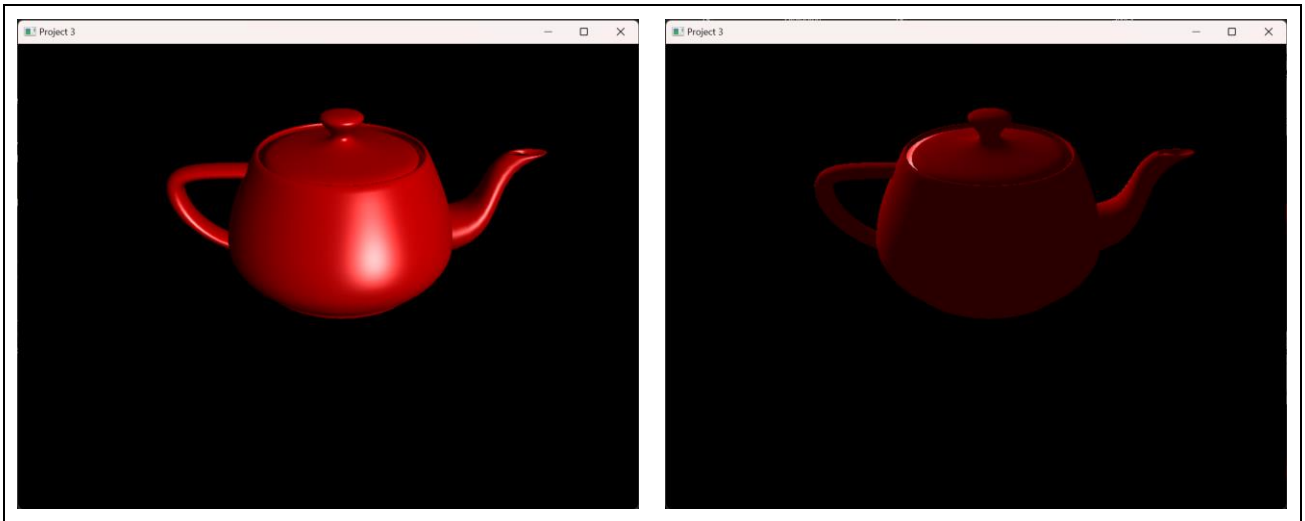
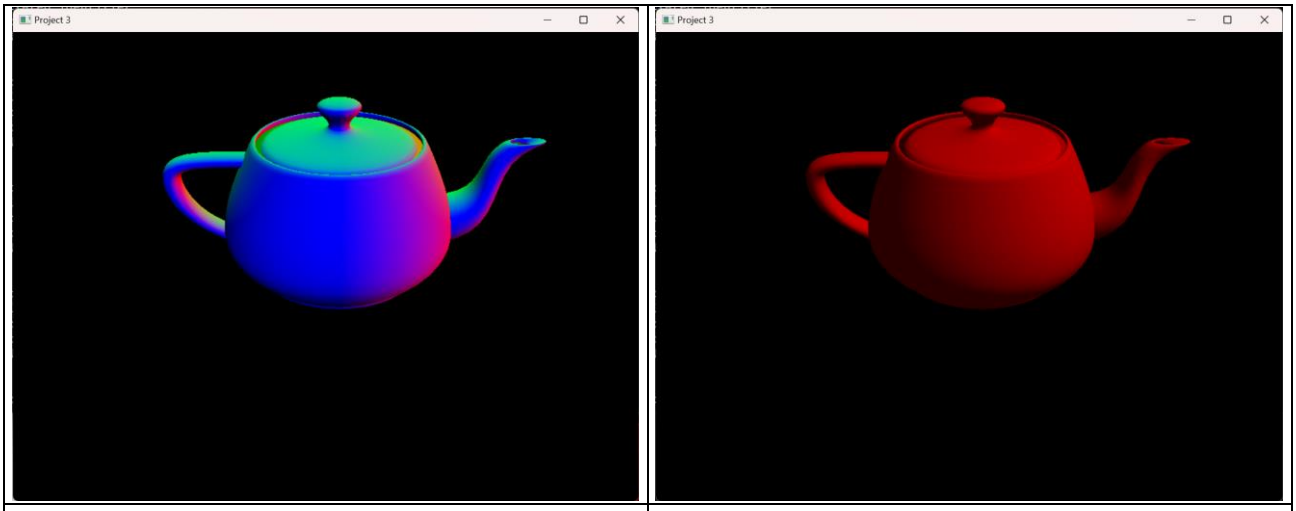
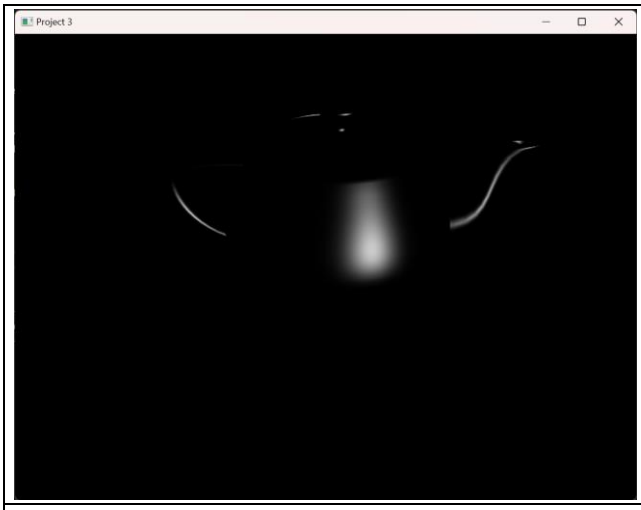


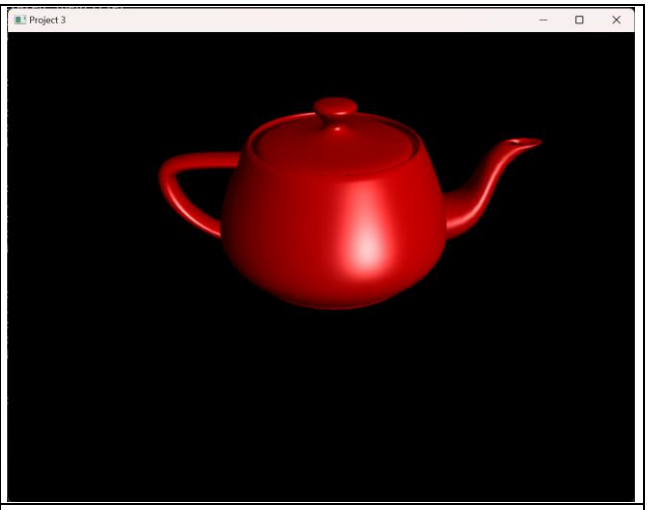
Fig 1. Rotate light around the object using CTRL + left mouse button (click and drag)



Surface Normal | *Ambient + Diffuse*



Spectral



Ambient + Diffuse + Spectral

Fig 2. Different lighting components

What could not be implemented?

The optional requirement:

- *Display the light as a separate object.*

Additional functionalities

Window resizing:

I've also implemented a resize function and mapped it to the `glutReshapeFunc()` callback. Whenever the window is resized, the viewport size is changed, and the object's size is preserved by adjusting the field-of-view (FOV) and the aspect ratio.

Previous projects' functionalities:

- Left mouse button to rotate and right mouse button to zoom in/out (click and drag).
- Centering the object on the window based on its boundary values.
- Re-compiling shaders on pressing F6 key.

How to use implementation?

```
g++ main.cpp -o main -lfreeglut -lglu32 -lopengl32 -lglew32
```

This command will generate the output file "main" ("main.exe" in Windows) in the working directory. This command includes the GLEW 32-bit linker. I didn't use an IDE and had all the libraries and headers globally installed, so I didn't have to use `-I` and `-L` tags to specify paths to headers and DLLs. The folder structure for the headers in `include` is as follows:

```
-> include
      -> GL / all FreeGLUT and GLEW headers
      -> cyCodeBase / all cyCodeBase headers
```

OS and Compiler

Operating System	Windows 11 (x64)
Compiler	g++

External libraries and additional requirements

Apart from FreeGLUT, GLEW and cyCodeBase have been used for this implementation.
