

CG Programming II – Assignment #1

In this assignment you will need to implement a single rotating cube with an animated light source. Each surface of the cube should consist of a single quadrilateral (or two triangles). Each cube surface should have ambient, diffuse, and specular reflection present. Ambient and diffuse reflection should be implemented using the standard OpenGL lighting system. Specular reflection should be implemented using DOT3 texture environment. The surface of the cube need not be bumpy and need not have a texture applied.

The most likely scenario is to implement ambient and diffuse lighting in one rendering pass and specular lighting in a second pass.

Required graphical elements:

- Rotating cube.
- OpenGL diffuse and ambient lighting.
- Animated point light source.
 - Light source moves (e.g., orbits the cube).
 - Light source has constant color.
 - Light source is represented on the screen using a point. Setting the point size > 1.0 would be helpful, but is not required.
- Specular reflection using DOT3 texture environment.

Required inputs:

- Escape must terminate the program.
- A key sequence must be available to enable or disable specular reflection (e.g., pressing 's').
- A key sequence must be available to enable or disable diffuse and ambient reflection (e.g., pressing 'd').
- A key sequence must be available to pause the animation.

<i>Criteria</i>	<i>Excellent</i>	<i>Good</i>	<i>Satisfactory</i>	<i>Marginal</i>	<i>Unacceptable</i>
Code Function	Program correctly implements all required graphical elements in a manner that is readily apparent when the program is executed. Appropriate algorithms and data structures are used in the implementation.	Program implements all required graphical elements, but the operation of some elements may not be obvious. Appropriate algorithms and data structures are used in the implementation.	Program implements all required graphical elements in some fashion. Algorithms and data structures are used that perform the required function, but may be less than ideal.	Program implements most required graphical elements in some fashion.	Most or all of the required graphical elements are missing or do not function correctly.
Code Mechanics	Program code is formatted in a consistent manner, variables and data structures are named in	Program code is mostly consistent, but contains some occasion inconsistencies.	Program code is readable. Individual functions or code blocks show consistent	Program code is not consistently formatted, but is still somewhat readable.	Program code is a mess and may be more suitable as an entry to the International

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	a consistent, logical manner. Code is commented adequately.		formatting, but that formatting does not carry through the entire program.		Obfuscated C Coding Competition.
User Interface	The program is responsive to input. All required inputs are implemented, and the user is informed, by the program, what the inputs are. The program can be terminated by the user.	The program is responsive to input. All required inputs are implemented. Some of the inputs are documented by the program.	The program is unresponsive under some circumstances. All required inputs are implemented. Some of the inputs are documented by the program.	The program is unresponsive under some circumstances. Some of the required inputs are either not implemented or are not implemented correctly. Some of the inputs are documented by the program.	Many of the required inputs are either not implemented or are not implemented correctly. The program lacks documentation for the inputs.