CSE 461 Programming Assignment 2

DUE

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Description

- This is an individual assignment. Please do not collaborate
- If you think that this document does not clearly describes the assignment, ask questions before its too late.

This assignment is about implementing a simple OpenGL application

Minimum Requirements

1. A bounded 3D world. (for example: interiors of a building)
2. Perspective projection
3. Realistic and logical ordering of rendered objects (uze z-buffering and create realistic objects.)
4. 4 different objects.(You can add more if you like).
5. One(minimum) of the objects has at least 3 copies at different positions and with different scales. At least one instance of an object rotates around an axis.
6. Different objects have different textures. One(minimum) of them has 2 textures blended.
7. In addition to textures, objects support Phong shading (blended with textures)
8. 4 different materials.
9. Mouse interaction:
    - Mouse look around (Similar to a FPS game)
    - Scroll zoom in and out
10. Keyboard interaction:
    - WASD and arrow keys are used in order to walk around in the 3D world.
    - ESC quits the program.
11. Multiple light sources(minimum 3). One of them is directional and one of them is a point light source.
12. Hit test. (While wandering around in the bounded world, it should not be possible to pass through the objects and bounds(walls etc..))
13. Any animation and movement speed should not depend on the rendering performance of the computer.

Each missing requirement will eat 15 points of your final grade.

Extra Features

If your application satisfies all of the minimum requirements, you can decide to implement the following items in order to get bonus points

1. Shadows (animated objects should be supported)
2. Mirror surfaces (animated objects should be supported)
3. Camera and object interaction (the object should be transformed in the world coordinate system after the interaction. for example: pushing an object by hitting it)

Each extra feature worths 10 points.

Remarks

- **You have to use vertex and pixel shaders.**
- Start as soon as possible (No extension will be given)
- You can use various tutorials and sample code as reference. but, understanding is essential. (You have to understand how it works and if asked you should be able to modify it.) (In order to decrease the chances of similarity with other submissions and example code, I advise you to understand the reference code and re-write according to what you understand.)
- You are going to do a demo. (Prepare different scenarios, test cases etc. . .) The application has to render at least 30 frames per second.

Turn in

- You are going to submit your implementation in a zip file. You will include a documentation about hot to compile and/or run your program. Include various screenshots as well.
- You are going to demonstrate the run of your program. It is going to be either through a teams meeting or in a face-to-face meeting.