OpenGL Homework 3

I have an apple with 2 shading and some effects.

Important!!

==Remember to submit your final project purposal @ E3==

upload name: memberID1_memberID2.pdf

Final Member List (https://docs.google.com/spreadsheets/d/1FWVlisVpQHZoCtKP3PbDww9zbO2sAPSorjJKBS_ru18/e

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1. Load model
2. Shader and GL binding
3. Write GLSL
4. Phong model
5. Flat shading
6. Phong shading
7. In your program
8. Demo video
9. Judgement

Load model

Done for you.

You can reference ==glm/glm.h== for data structure.

Shader and GL binding

1. You can ==ONLY== use VBO and VertexAttributePointer to pass attributes into vertex shader.

2. You can ==ONLY== use glUniform* to pass uniform data into shaders.

Write GLSL

1. version define ≧ ==#version 330==, put your shader version explicitly.

2. No ==attribute==, ==varying== in your shader code.

3. You can ==NOT== use built-in uniform variable.

```
gl_ModelViewMatix *
gl_ProjectionMatix
gl_ModelViewProjectionMatix
gl_NormalMatrix
...
```

Phong model

$ I = K_aL_a + K_dL_d(l \cdot n) + K_sL_s(v \cdot r)^\alpha $

1. We assume L to vec3(1.0)
2. We use texture color as K_d
3. Now, we get $I = K_a + \mathrm{Texture.rgb}(l \cdot n) + K_s(v \cdot r)^\alpha$

Flat shading

1. When we calculate about normal, use ==the ONLY== normal for all fragments in the same geometry.
2. We use ==triangle face normal== for it in this homework.
3. The specular term is ==NOT== necessary.

Phong shading

1. We should interpolate all normals in each pixel.
2. Then calculate shading in each pixel.

In your program

1. glutCreateWindow("OpenGL HW3 - student_id");
2. One key for switching 2 or more shaders.
3. Apple at (0, 0, 0)
4. If you don't write control functions, you ==SHOULDN'T== modify light_pos and gluLookAt
5. ==DO NOT== modify gluPerspective

Demo Video

{%youtube PL4KWWONe-c %}

Judgement

- Correct shading model
    - Correct matrix transform (50 pt)
    - Correct shading (50 pt)

- Bonus (20 pt)
    - Other effects in vertex or fragment shader (excluding example)
    - Other buffer objects binding (VAO or else)
    - Draw other models with texture (multi-materials)

- Upload file format
    - studentId_hw3(.linux)==.zip== or ==.7z==
    - a readme file for your program
    - a makefile if Linux
    - project meta files(.sln and else) if Windows
    - wrong format (- 10 pt)
- Due time
    - 2016/12/12(Mon) 23:59 @ E3
    - - 10 pt per day delay