

Assignment 2 – Lighting Detail Instruction

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Goal

- ◆ **Implement 3 types of light sources:**
 - ◆ **Directional light**
 - ◆ **Position light (Point light)**
 - ◆ **Spot light**
- ◆ **Interact and modify the light source in runtime.**
- ◆ **Finish the code in main.cpp, vertex shader and fragment shader**



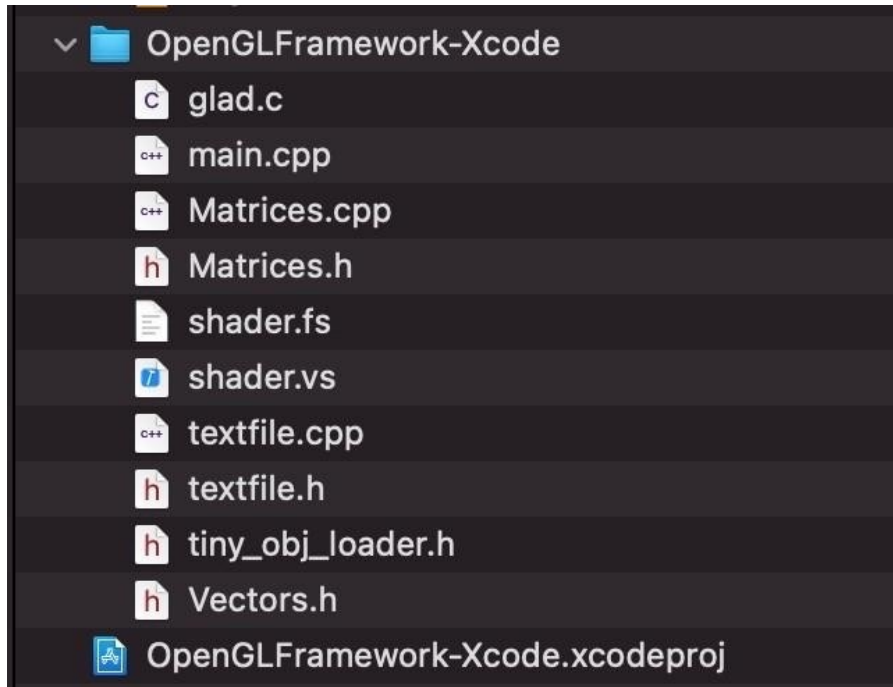
Assignment 2

- ◆ Announce date: 2024/05/01
- ◆ Deadline: **2024/05/22 23:59(UTC+8)**
- ◆ Late work will be penalized by 20/week.
- ◆ **Copy & paste others' code will get 0.**
- ◆ Hand in your homework to EECLASS in the following format(**-10 for penalty**)
 - ◆ studentID_HW2.zip
 - ◆ studentID_HW2_Report.pdf



In studentID_HW2.zip

- ◆ Depend on your device
- ◆ **-10 for those upload “Normal Models”**



For Mac



In studentID_HW2.zip

- ◆ Depend on your device
- ◆ **-10 for those upload “x64” or “Normal Models”**

- glad.c
- main.cpp
- Matrices.cpp
- Matrices.h
- OpenGLFramework-VS2017.exe
- shader.fs
- shader.vs
- textfile.cpp
- textfile.h
- tiny_obj_loader.h
- Vectors.h

For Windows

- NormalModels**
- Unzip_dir
 - glad.c
 - main.cpp
 - Matrices.cpp
 - Matrices.h
 - OpenGLFramework-VS2017.exe
 - shader.fs
 - shader.vs
 - textfile.cpp
 - textfile.h
 - tiny_obj_loader.h
 - Vectors.h

Don't upload!!!

Make Sure exe can run



Lighting Attribute Reference

- ◆ **Directional light:**
 - ◆ **Position:** (1, 1, 1)
 - ◆ **Direction:** always pointing at (0, 0, 0)
- ◆ **Position(point) light**
 - ◆ **Position:** (0, 2, 1)
- ◆ **Spot light**
 - ◆ **Position:** (0, 0, 2)
 - ◆ **Direction:** (0, 0, -1)
 - ◆ **Exponent:** 50
 - ◆ **Cutoff:** 30 degree



Lighting Attribute Reference

- ◆ Diffuse intensity: (1, 1, 1)
- ◆ Ambient intensity: (0.15, 0.15, 0.15)
- ◆ Specular intensity: (1, 1, 1)
- ◆ Shininess: 64
- ◆ Attenuation:
 - ◆ Point light:
 - ◆ Constant: 0.01
 - ◆ Linear: 0.8
 - ◆ Quadratic: 0.1
 - ◆ Spot light:
 - ◆ Constant: 0.05
 - ◆ Linear: 0.3
 - ◆ Quadratic: 0.6



Key Mapping

- ◆ Please follow the spec bellow, or you would not get the score of item.
- ◆ You **must** make sure your key mapping is **exactly same** to ours.
- ◆ Z/X: switch the model
- ◆ T: switch to translation mode
- ◆ S: switch to scale mode
- ◆ R: switch to rotation mode



Key Mapping

- ◆ **L: switch between directional/point/spot light**
- ◆ **K: switch to light editing mode**
- ◆ **J: switch to shininess editing mode**



Key Mapping

- ◆ If you switch mode by T, S, R
- ◆ Apply change on **Z** axis when scroll the wheel
- ◆ Apply change on **X** axis when mouse **drag horizontally**
- ◆ Apply change on **Y** axis when mouse **drag vertically**
- ◆ Only rotation should apply X axis when mouse drag vertically, and Y axis when mouse drag horizontally



Key Mapping

- ◆ If you switch mode by K
- ◆ Apply change on **X** axis of light's position when mouse **drag horizontally**
- ◆ Apply change on **Y** axis of light's position when mouse **drag vertically**
- ◆ Apply change on **diffuse intensity** for **directional or point light**, **cutoff angle** for **spot light** when scroll the wheel



Key Mapping

- ◆ If you switch mode by J
- ◆ Apply change on **shininess** when scroll the wheel
- ◆ The **shininess** is applied to all models.



Report

- ◆ **Some screen shot**
- ◆ **Description of your program control instructions**
- ◆ **Other special things you have done**



Grading Policy

Item	Score
Directional light	20%
Point light	20%
Spot light	20%
Per-pixel lighting / Per-vertex lighting	15%
Side-by-side viewport	5%
Switch lights & models	5%
Dynamic light position, cutoff, shininess	10%
Report	5%
Total	100%