Assignment 2 – Lighting Detail Instruction

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ICL/ITRI

Goal

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

Assignment 2

◆ **Announce date: 2020/05/06**

◆ **Deadline: 2020/05/23 23:59 (UTC+8)**

◆ **Late work will be penalized by 20/week.**

◆ **Hand in your homework by FTP in the following format:**

- **Student ID (create one folder)**
  - ‣ **studentID_HW2.zip**
  - ‣ **studentID_HW2_Report.pdf**

FTP

- **Use FileZilla to upload your assignment**
- **Server: cgv.cs.nthu.edu.tw**
- **Account: cg2020**
- **Password: 2020cg**
- **Folder: Assignment 2**
- **To upload a new version, create a new one with _v2, for example: 123456789_HW2_v2.zip**

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)**
- **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	25%
Point light	25%
Spot light	25%
Side-by-side viewport	5%
Switch lights & models	5%
Dynamic light position, cutoff, shininess	10%
Report	5%
Total	100%