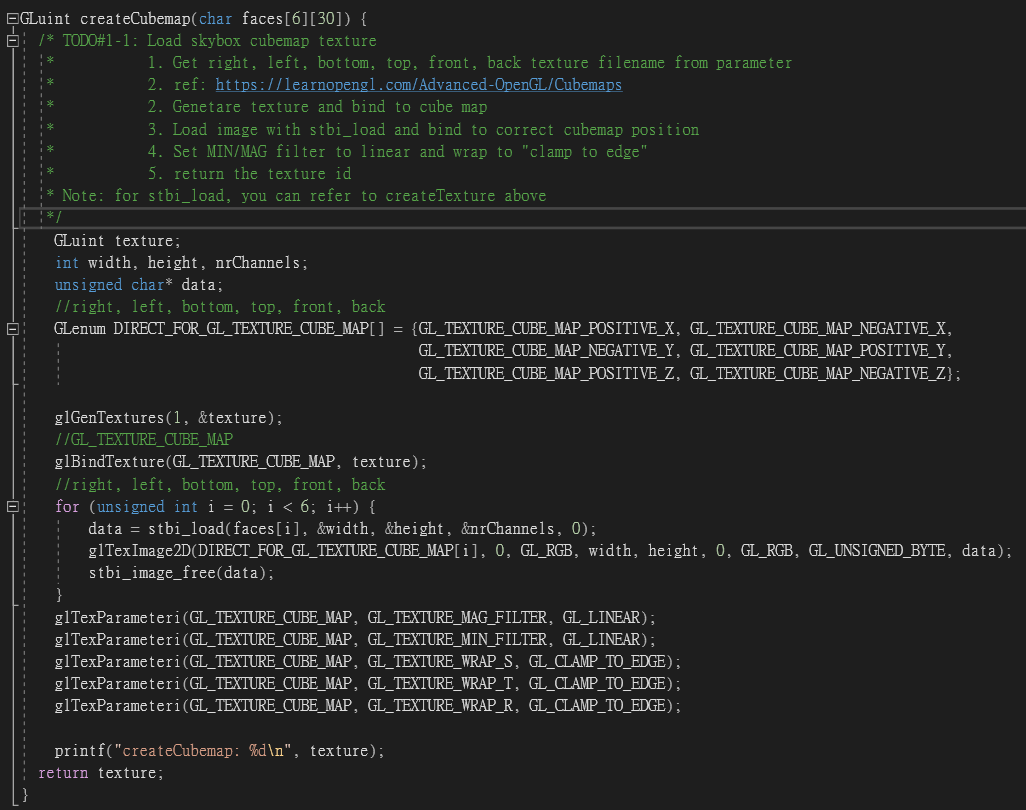
**HW3**

**TODO#1-1: Load skybox cubemap texture: **

參數設定

Skybox的方向面的參數

Skybox的各方向面的讀檔

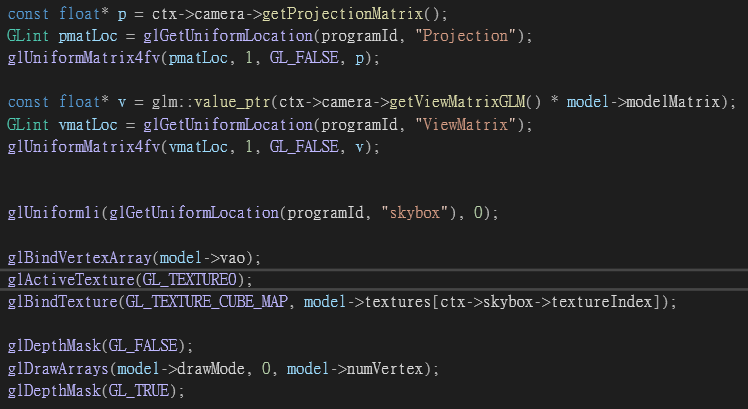
**TODO#1-1: Add skybox mode:**

****

給材質檔案位置

給點座標

**TODO#1-2: Render skybox with shader:**

****

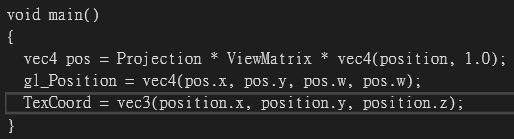
畫skybox

Bind & Active Texture

將變數傳給shader

**TODO#1-2: vertex shader / fragment shader**

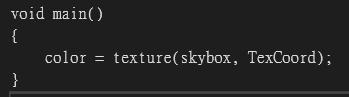
vertex shader

****

計算gl\_Position

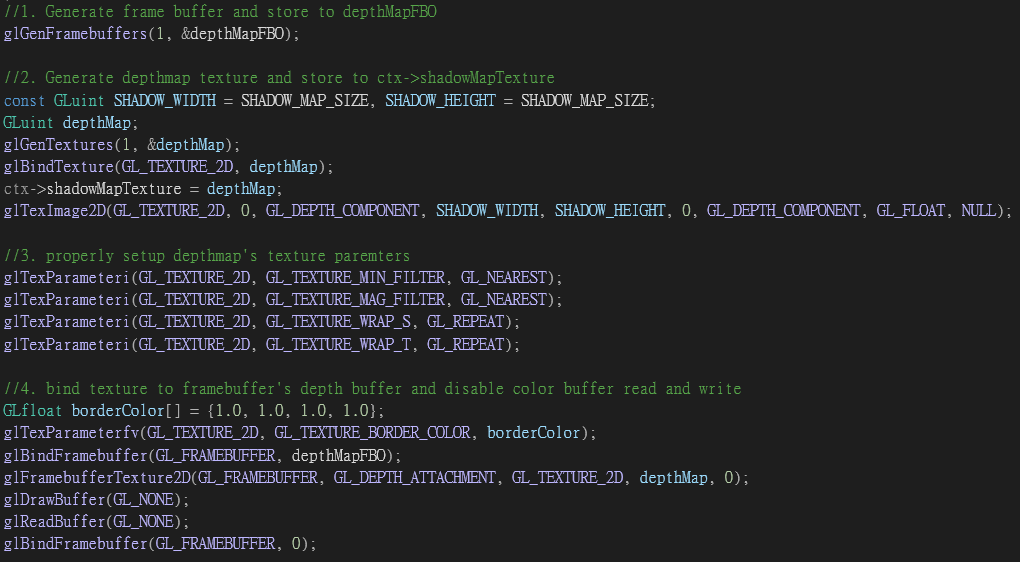
傳TexCoord到fragment shader

fragment shader

****

取得材質color

**TODO#2-1 Generate frame buffer and depth map for shadow program**

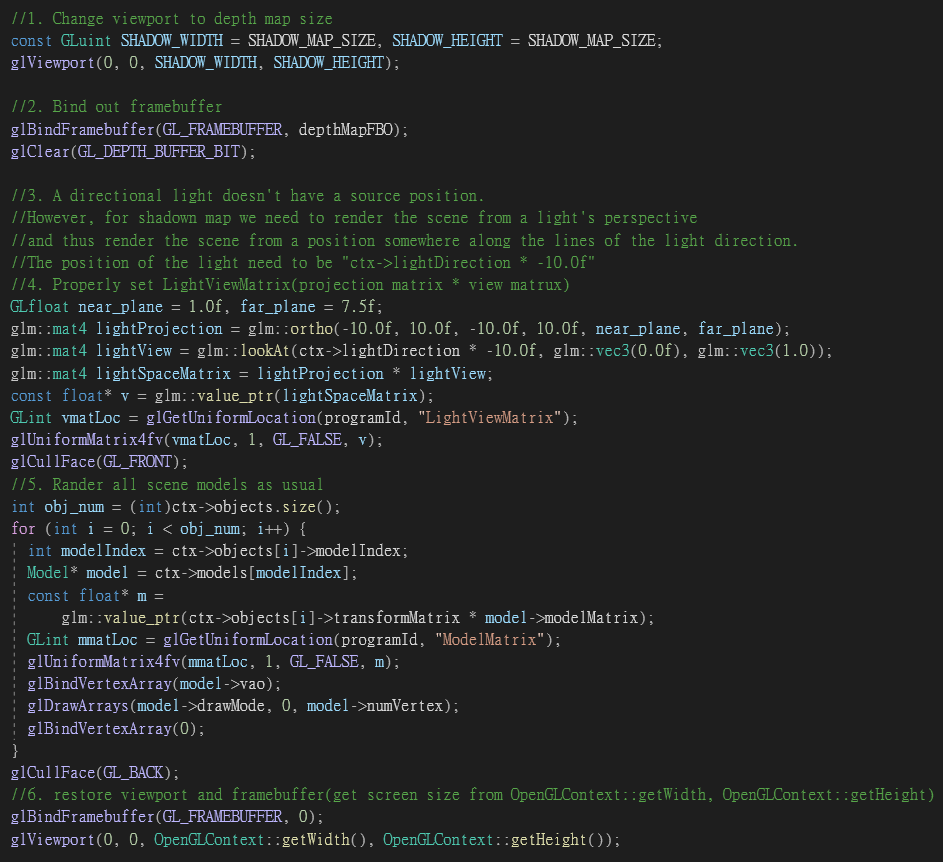
****

bind texture to framebuffer's depth buffer and disable color buffer read and write

Generate depthmap texture and store to ctx->shadowMapTexture

Generate frame buffer and store to depthMapFBO

**TODO#2-2: Render depth map with shader**

****

restore viewport and framebuffer(get screen size from OpenGLContext::getWidth, OpenGLContext::getHeight)

Render all scene models as usual

Properly set LightViewMatrix(projection matrix \* view matrux)

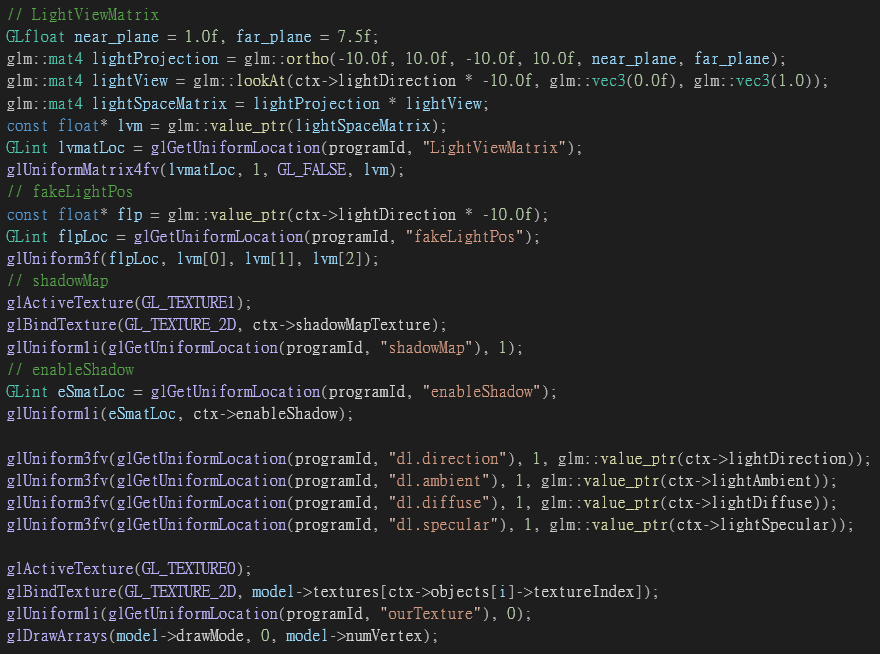
Bind out framebuffer

Change viewport to depth map size

**TODO#2-3: Render scene with shadow mapping**

* Copy from LightProgram

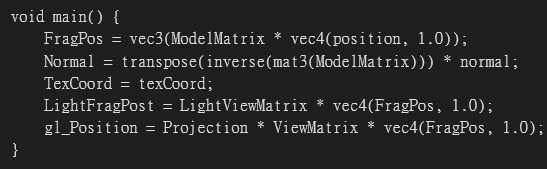
****

****

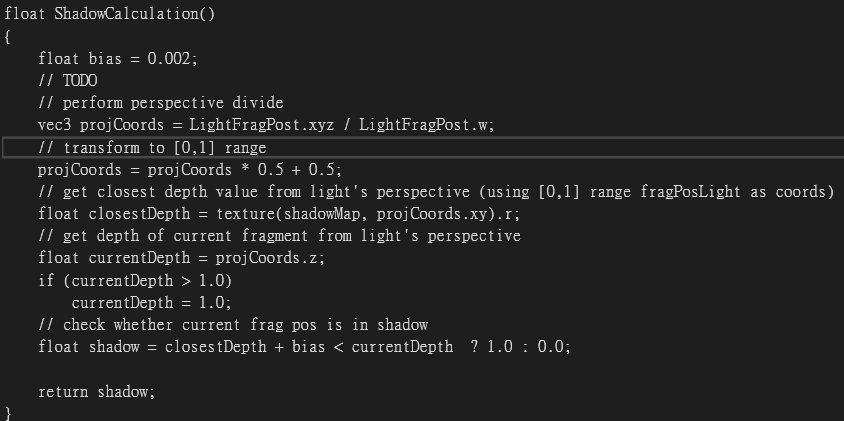
Pass LightViewMatrix, fakeLightPos, shadowMap, enableShadow to shader program

**TODO#2-4: shadow-enabled shader with single direct light**

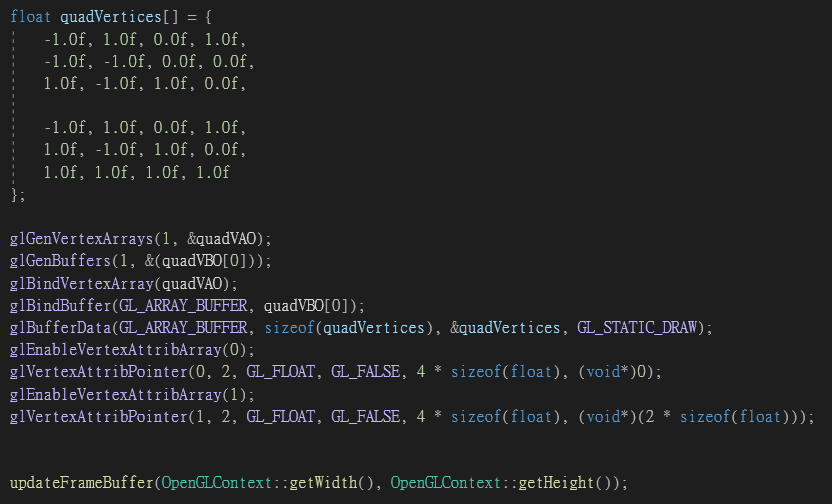
vertex shader

****

fragment shader: 計算是否在陰影裡

****

**TODO#3-1: Generate Framebuffer and VAO/VBO for filter**

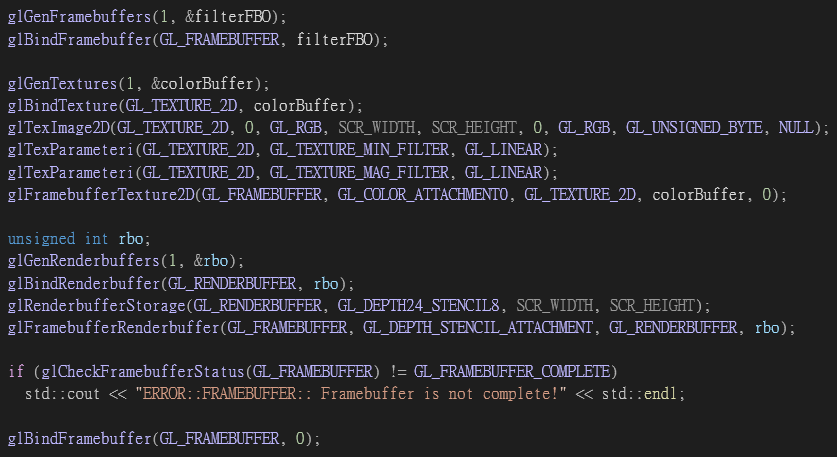
****

設定VAO/VBO

並傳位置到shader

設定quadVertices

**TODO#3-1: generate color/depth buffer for frame buffer**

****

Generate/Bind a render buffer inad store in rboDepth

Set Render buffer size to SCR\_WIDTH\*SCR\_HEIGHT

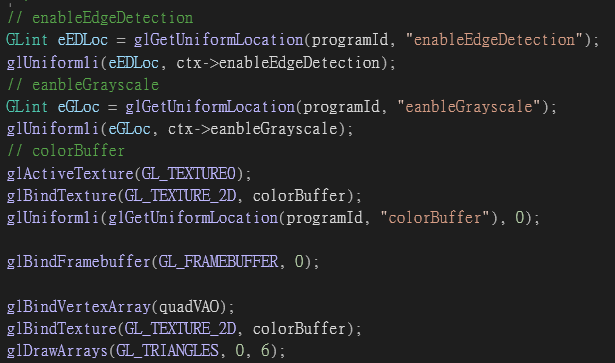
Attach colorBuffer and rboDepth to filterFBO

Generate color buffer texture and store in colorBuffer

Set texture size to SCR\_WIDTH\*SCR\_HEIGHT

Set MIN/MAG filter to linear

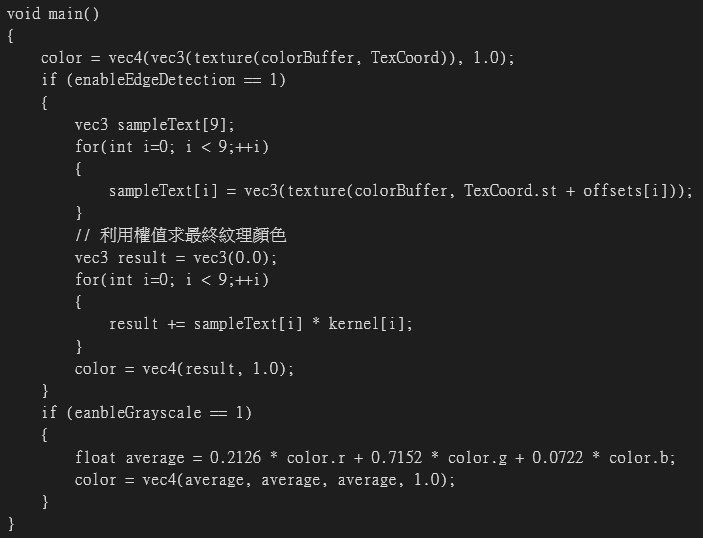
**TODO#3-1: pass VAO, enableEdgeDetection, eanbleGrayscale, colorBuffer to shader and render**

****

render

pass VAO, enableEdgeDetection, eanbleGrayscale, colorBuffer to shader

**TODO#3-2: apply filter to color**

****

灰階運算

邊緣運算

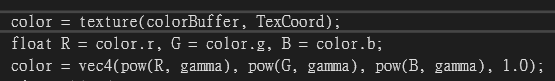
**Problems you encountered**

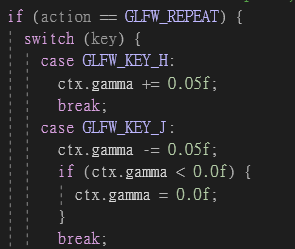
* Task2的shadow與shadowLight區分不清楚，誤以為在shadow就要畫出陰影

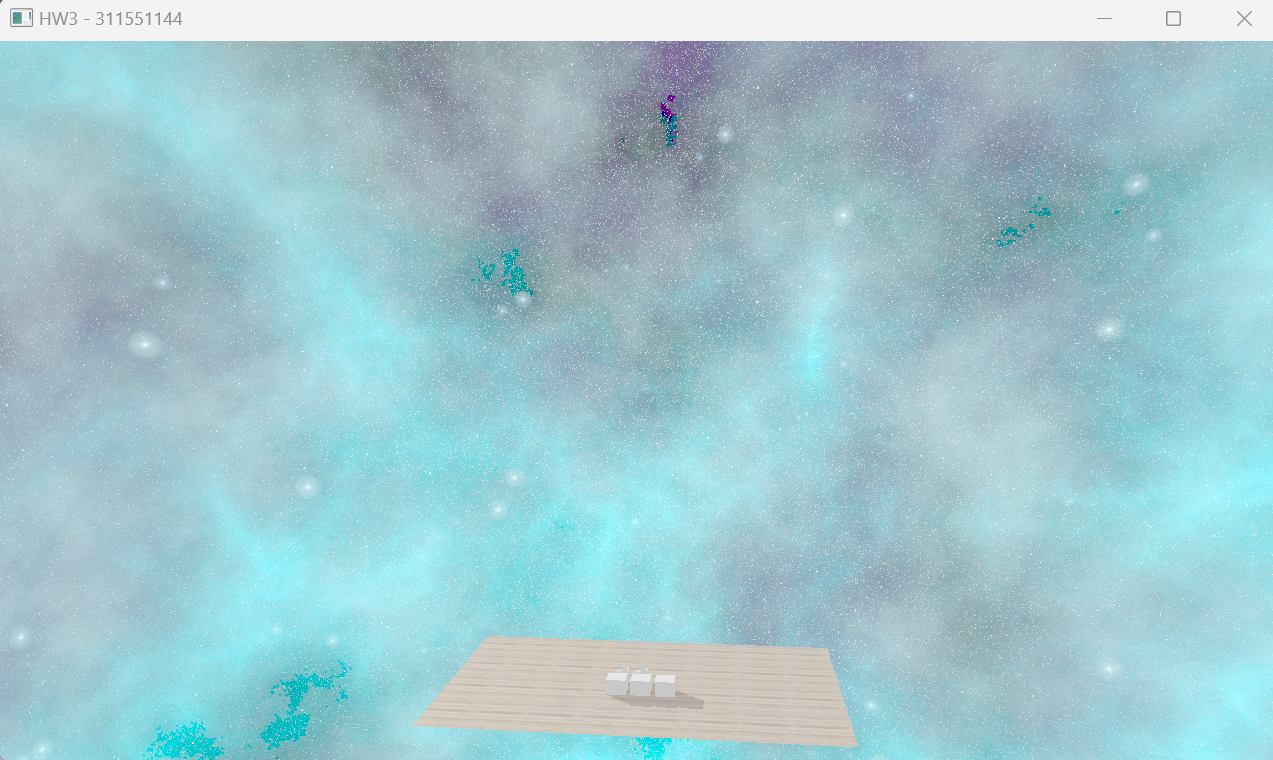
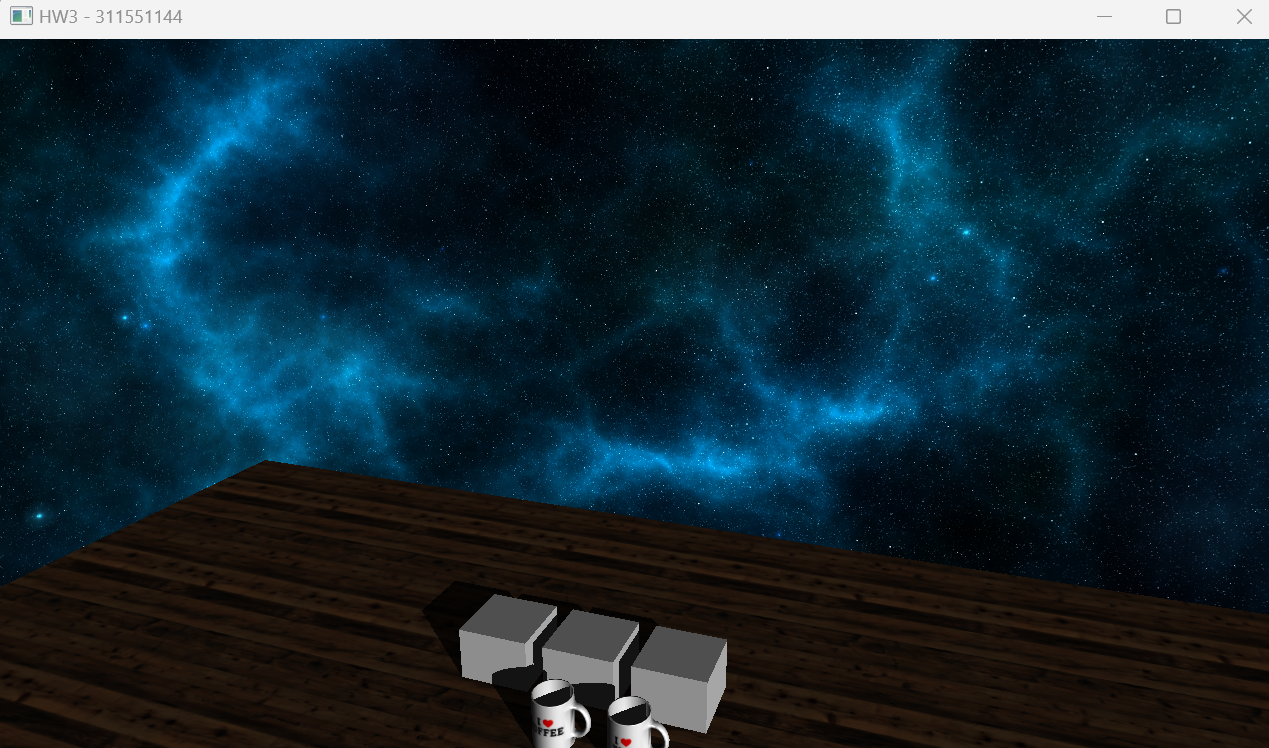
**BONUS:**

使用按鍵H&J調整Gamma做Gamma Correction

P.S 調到過曝可以找到星星(?)





****