700106 / 700120 Lab Book

Week 8 – Lab H

**Exercise 1. Draw Environment  
Question:**Text

Description automatically generated

Graphical user interface, text, application

Description automatically generated

Text

Description automatically generated

Graphical user interface, text, application, email

Description automatically generated

**Solution:**

1. As mentioned in the question follow the steps.

Firstly, will be modifying the tutorial 07 for this assignment.

Add the texture coordinate in SimpleVertex

Graphical user interface, text

Description automatically generated

Modify the input layout  
Text

Description automatically generated

Add the corresponding texture coordinates in the vertex array, as shown below.

Table

Description automatically generated

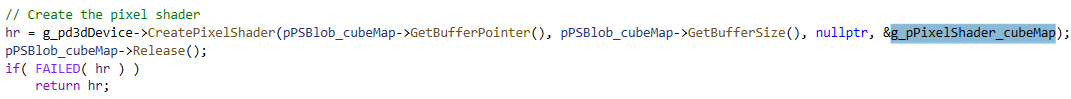
Next, load the texture and sampler.

Text

Description automatically generated

In order to use the cube mapping, create new vertex and pixel shader.  
A picture containing text

Description automatically generated



For the sky and cube as given in the question create the rasterization states.

Graphical user interface, text, application

Description automatically generated

Set the depth stencil for the same.

Graphical user interface, text, application, email

Description automatically generated

Graphical user interface, text, application

Description automatically generated

Finally, in the render() set all the configurations as given below and call DrawIndexed().

Text

Description automatically generated

Now, modify the corresponding changes in the vertex and pixel shader.

Firstly, define the sampler and the texture cube.

Text

Description automatically generated

Modify the vertex shader accordingly.

Text

Description automatically generated

And pixel shader.

Graphical user interface, website

Description automatically generated

**Sample output:  
A picture containing text, outdoor, snow, mountain

Description automatically generated**

**Reflection:** In this assignment, I got to know about the Cube mapping.

**Exercise 2: Draw reflective shiny object.**

**Question:**

Text

Description automatically generated

**Solution:**

1. Firstly will be using same code as first assignment, need to draw one more cube, which is given below.

Text

Description automatically generated

Next, in vertex shader we have already calculated the cube reflect the environment, both view direction, so no modification is required.

Text

Description automatically generated

Then, will be modify the pixel shader for the reflection in the view direction.

Graphical user interface, text, application

Description automatically generated

**Sample output:**A picture containing text, outdoor, snow, mountain

Description automatically generated

**Reflection**: As in the previous exercise, here we are doing cube mapping along with drew the shiny cube in the environment and it can be achieved by using the below line, which is basically defining the reflection.

float3 viewDir = reflect(input.viewDir, (float3) input.Norm);

**Exercise 3. Draw Transparent shiny object.**

**Question:**

Graphical user interface, text

Description automatically generated

**Solution:**

**1**. Firstly, will be using the second exercise code to achieve this and will be modifying the pixel shader, which is given below.

Text

Description automatically generated

**Sample output:**  
**A picture containing text, outdoor, rock

Description automatically generatedA picture containing text, outdoor, snow, sky

Description automatically generated**

**Reflection:**

In this assignment got to know about reflection and the refraction of the object and how we can apply that in the pixel shader. In the pixel shader we have used the refract and reflect, which is given below.

float3 viewDirection = reflect(input.viewDir, (float3) input.Norm);  
float3 refDir = refract(viewDirection, (float3) input.Norm, 0.9);

Additionally, while returning we are combing the half (0.5) of refraction and reflection.

return 0.5 \* reflColor + 0.5 \* skyColor;

**Exercise 4. Character animation using a cube model**

**Question:**

**A picture containing text, orange, dark

Description automatically generated  
A screenshot of a computer

Description automatically generated with medium confidence**

**Solution:**

**1**. In this will be using tutorial 4, in order to create quads will be altering the vertices which is given below.

Text

Description automatically generated

And corresponding indices.

Text

Description automatically generated

Will be using the fire texture and the sampler.

Text

Description automatically generated

Next, blending the colour which is given below.

Text

Description automatically generated

Then, defining the rasterization and depth stencil tests.

Graphical user interface, text

Description automatically generated

Graphical user interface, text, application

Description automatically generated

In the Render() method will be drawing DrawIndexed() function.  
Text

Description automatically generated

In the vertex and pixel shader will be define the life span and velocity, the code will look like below.

Text

Description automatically generated

And the pixel shader.

Graphical user interface, text, application, Word

Description automatically generated

**Sample output:  
A picture containing shape

Description automatically generatedA picture containing text

Description automatically generated**

**A picture containing graphical user interface

Description automatically generatedGraphical user interface

Description automatically generated**

**Reflection:**

Here, in this assignment got to know about the quads and applying an animation to the objects and providing the life span and velocity to an object. In the above output the 300 quads are used and applied the fire texture; we can clearly see the object is moving and has a life span so the applied texture is fading over the time.