CS411 – Report 6

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**Writing Quesitons:**

Writing Questions answer should in “/data/Chengxi\_Shi\_CS411\_Assignment 6.pdf”

**Coding Questions:**

All function implements should in file “cs411-assignment5-template.html” and “cs411-assignment5-template.js”, which is based on the work of AS5.

**Summary for program design:**

To achieve all the tasks, it can be separated into three part. The first part is changing the light source location/position. The second and third is using slider bar to change all the attributes that related with light intensity, which can be write as light source ambient, diffuse coefficient and specular coefficient; material ambient, diffuse coefficient and specular coefficient.

For the light source, since the AS5 code gives the light direction, which without any other clue about light source. So, to change the location, we need to the set the light source by ourselves, which can be written as lightPos = new Vector4(10.0, -10.0, 10.0, 1.0); Use the light position, we can calculate the distance from the light source to the vertex, which is L, and the vector to the camera, which is R.

After we get the light source, we can use it to change the light position, which buy six relative buttons. And for light intensity, we will use I total = I ambient + f(d)(I diffuse + I specular), where attenuation will be changed by the slide bars. Also, the coefficient with light source and material should also be changed by the users, which by using the slide bar.

After setting by users, we need to pass all the attributes to the shader so that it will provide a correct rendering.

**Questions faced and solution:**

Writing part:

1. In Question b, cannot do attenuation first

A: I ignore the text describe about attenuation factor kc, kl and kq firstly. However, it can directly use these coefficients to calculate attenuation, where f(d) = 1/(kc+kl \* d+kq \* d^2). Also, do forget the normalize of L, where L = light source – vertex location, and then do the normalize.

1. In Question d does not give viewer position.

A: We assume R and V are the same, where R dot product V is 1.

1. In Question f does not give attenuation factor and Intensity of specular.

A: We assume f(d) = 1 and Id = Is = (1,2,3). However, it finally has a negative result which is strange.

1. In Question I, confused about why ignore the refraction

A: because refraction light goes away, which does not join the calculation in the space. So, we just ignore it.

1. In Question m, how to calculate vertex normal from face normal?

A: for the vertex normal, we try to find all the faces that the vertex connects with. Sum all the face normal together and do the average to get the vertex normal.

Coding part:

1. How to use the slider bar instead of button

A: It can be easily writing as <div class="slidecontainer">

<p>Light:Ambient</P><input type="range" min="0" max="1" value="0.5" step="0.01" class="slider" id="ambient\_L">

</div>, where the value getting is similar as button, which is document.getElementById('ambient\_L').value

1. After setting, cannot pass the new value to the shaders.

A: wrong use about lightProperties[0] = document.getElementById('ambientSl').value. Actually, it should be written as lightProperties.elements[0] = document.getElementById('ambient\_L').value, which will provide a correct passing.

1. Not that effective light effect

A: since the time reason, I cannot find out the reason that why the light source will not be that effective on the objects that I discussed with Matthew.