INFO6014 – Graphics 1: Final Exam

Wednesday, December 14th, 2011, 10:00 AM to 10:00 PM

Instructor: Michael Feeney

The exam format:

- The questions are ***not*** of equal weight. There are three (3) pages with eight (8) questions with a total of 185 marks (if my math is correct)

- The answers may be one or a combination of the following:

    o Short answer (in your own words)
    o Snippets of code
    o Complete running solutions

- <u>CLEARLY</u> indicate which answer goes to which question. My suggestion is that you place each answer in its own folder, named "Question_01", "Question_02" and so on (or something equally clear). Another option is to create a Visual Studio solution and add a number of projects – one per question – to it.

- Place any written answers into a Word, RTF, or text file. Again, *clearly* indicate which question you are answering.

- If you are combining answers (which is possible), please indicate this with a "readme" file or some note (not buried in the source code somewhere) indicating this.

- For applications: If it doesn't build and run; it's like you didn't answer it. I'll correct trivial, obvious problems, but you need to be sure that it compiles and/or runs.

- You have until 10:00 PM on Wednesday, December 14th to submit all your files to the appropriate drop box on Fanshawe Online; note that it is not written to take twelve (12) hours, it's just that you have that long to complete it.

- This is an "open book" style exam, but keep in mind that there is a difference between "collaboration and learning" and "plagiarism," so:

    o There may be some slight customization on each test. In other words, they will be the same "type" of questions – i.e. I'm looking that you can demonstrate a particular thing – but the specifics are different
    o I will be very suspicious of code that is virtually identical.

- You can reach me:
    o In my "cubicle of destiny" most afternoons this week (I'm invigilating in the mornings)
    o On the office phone: (519) 452-4430 x4798
    o My cell 519-494-7569
    o Or through e-mail (mfeeney@fanshawec.ca), of course.

For all questions:

- Use "A" and "D" to adjust the "x" (right and left) axis
- Use "W" and "S" to adjust the "z" (forward and backward) axis
- Use "Arrow Up" and "Arrow Down" to adjust the "y" (up and down) axis
- You can use the "Section_16_part_d_g1_ASCII.ply" from the power plant model, which is a "building like" structure that is good for showing lighting. If you are looking for a single model to demonstrate something, this is good.
- When asked to produce a "scene," you can **_not_** use the "sea of teapots" from class – you must create something else.

1. (10 marks) What is the specular component used for in lighting? What happens when you remove it or don't take it into account?

2. (15 marks) How do you set orthographic perspective in DirectX 10?

3. (10 marks) What version of HLSL have we been using? How did you find out?

4. (50) Create a program that uses the verySimpleShader.fx included in the zip file. It is a simple shader that uses a single white point light (so you only need to pass the light position, the camera location, and the object material information – no other lighting information is needed besides the position), and takes only the vertex position and normal.

5. (10 marks) Alter the solution in question three (3) so that you can move the point light around some scene so you can see the light changing.

6. (15 marks) Create a scene using the "HLSL_4_BasicLightFunctions.fx" shader (that's the one with the lighting that we've been using in class) that allows you to change the attenuation of the spot or point light with the keyboard. Place the light anywhere you want so that this effect is clearly visible.

7. (50 marks) Demonstrate a scene that is using a second texture coordinate in the vertex buffer. In other words:

- o You will need to add a second texture coordinate to the vertex buffer
- o You will need to load this second texture coordinate (you can use the same texture cords a the "first" one if you like)
- o You should have two textures, but one texture is using the "first" texture coordinate, and the second texture is using the "second" set of texture coordinates.
- o Add keyboard controls that allow you to "turn on" and "turn off" each texture.
- o The textures should be combined with the lighting (i.e. the two textures and the lighting combine to produce the final pixel colour)

8. (25 marks) Use the PrntScr key to take six pictures of the files contained in each of your courses. In other words, open up Windows Explorer to the "Graphics 1" folder and take a screen shot of that. Then go to "Animation 1" and take a screen shot of that, and so on. When you have all six images, place them in a cube map and use that in an example application. You can either use this a "skybox" or as a reflection.

That's it