COMS 4160

hw1 part 1

xw2501

**Functions:**

* ‘loadMesh’

Using a bufferedreader to read the ‘obj’ file line by line.

As all the ‘positions’ start with ‘v’, ‘textCoords’ start with ‘vt’, ‘norms’ start with ‘vn’ and ‘indices’ start with ‘f’. I use this as the way to decide which array the following data belong to.

Also, as the length of arrays are not known priorly, I use an ArrayList to store the data and then create the relevant array.

Special notes:

* The data of ‘indices’ in ‘bunny.obj’ has a special format like ‘xxxx//xxxx’. Thus, when reading indices, I specially devide the data according to ‘//’.
* As the ‘textCoords’ in ‘bunny.obj’ are missing, I manully added all ‘0.0’s for ‘textCoords’. And the length of ‘textCoords’ array is 2/3 of the length of ‘positions’.
* There is something wrong with the origin ‘indices’, when this function is loading data for ‘indices’, all the data is substracted by 1.

All above, **this function works well with ‘bunny.obj’ as input, but** **it may not work for other object files.**

* ‘translate’

Implemented the translate matrix.

**The way I do it is not by matrix multiplying but by changing the positions one by one.**

* ‘scale’

Implemented the translate matrix.

**The way I do it is not by matrix multiplying but by changing the positions one by one.**

* ‘rotate’

Implemented the translate matrix. (<https://en.wikipedia.org/wiki/Rotation_matrix> )

**The way I do it is not by matrix multiplying but by changing the positions one by one.**

* ‘reflect’

Implemented the reflect matrix. (<https://en.wikipedia.org/wiki/Transformation_matrix#Reflection> )

Where , , and

**The way I do it is not by matrix multiplying but by changing the positions one by one.**

* cameraProjection
* ‘getModelMatrix’

This matrix is generated by following formula

* ‘getViewMatrix’

(<http://community.monogame.net/t/view-matrix/8560> )

* ‘getProjectionMatrix’

**Notes:**

To test all functions, run main function anf then press 7,8,9,0 key to manipulate the bunny.

In order to have good performance, I changed the input parameters of some of the functions. I made a short video to illustrate the whole project.

No special libraries are used. All the libraries used are already included in the workspace. For your information, the environment I used for test is windows 10 with Java 8 on Eclipse platform.