CS 551 Write-Up Assignment#3

Haoxiang Wang
#932359049

1. A discussion of the difficulties that you have encountered in this assignment.

   The difficulty I had in compiling my code in previous two assignments doesn't exist in this one due to the fact that I completely understand the method right now. However, I still have a lot difficulty in this assignment.

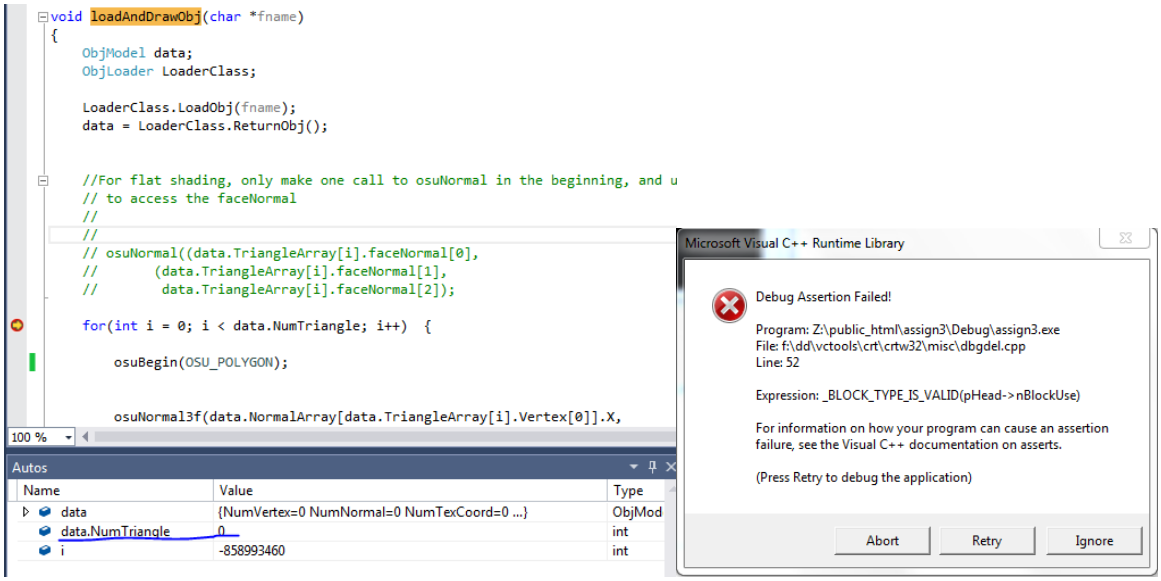
   The very first one is due to the files we have in this assignment. I haven't worked with objects before, and one of the requirements of the assignment is letting us to write the test code by ourselves. To be honest, I completely have no idea of how to implement those objects using the functions I wrote. Thanks for the helping of my classmates and the code provided by the teacher, I finally got the idea how to deal with it, but only implement the three that are provided. For the rest other cases, I am trying to implement them but due to the time issue, I cannot.

   The second thing is that to combine the previous two assignments' code together in order to implement this one, which is also a requirement of this assignment. I wrote previous two assignments completely based on the requirements at that time. This means that I have to make a lot changes to my previous code and make them work for this assignment.

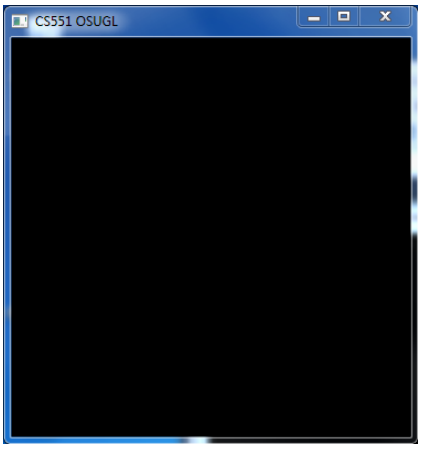
   The third thing is an important and also embarrassing one, which is the time management. I talked about my time management problem in previous two assignments, but I went into it again. I had a midterm exam just a day before this assignment's due date, so I didn't have enough time to do this time's homework. I had to submit the homework two days late in order to getting my code running without errors, although it will cost 20% off of my grades. And I used the third day after the due date to make my code can surely plot something on the plane, whether they are correct or not, and provides some evidence to show some of my functions works well.

   The last and the biggest difficulty is the debugging. I spend a really long time on debugging, and I also run into some problems. The following two pictures show the problems I had when I was debugging. The first one is that, when I was trying to run first case, the object loaded in but the number of triangles remains 0. I think that's the reason why I cannot get the right answer for this one, but I cannot find the way to fix it. The function "loadAndDrawObj" is provided by the teacher, and I also don't

have any experience with C++, so I am really not sure how to get it right. The second picture shows the error I got when my “osuEnd” function runs to the last part. At first, I really don’t know where dose this error come from. However after debugging with breakpoints, I finally find that I free an array in a wrong way causes this problem, and I got a chance to fix it.

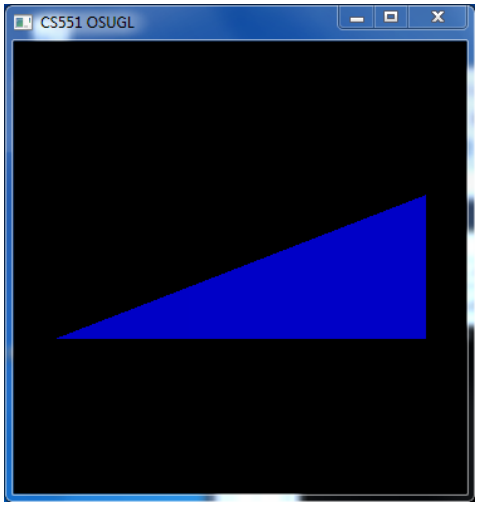


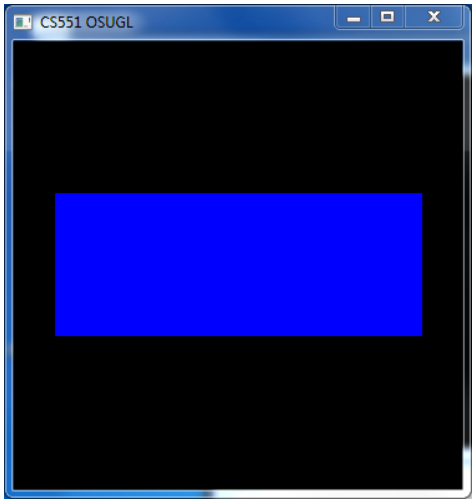
After a hard time struggling with the errors, my code runs successfully. However, successfully running doesn’t mean I can get right result. Just like what shown above in the first picture, there are some variables don’t have the correct value, and I cannot find the reason and fix them. In some cases, the program doesn’t even go into the “osuWritePixel” part to write the pixels on the plane. The program will just skip that part and reach the end. I think this is the reason why I always get a whole black plane just like the picture shows below.



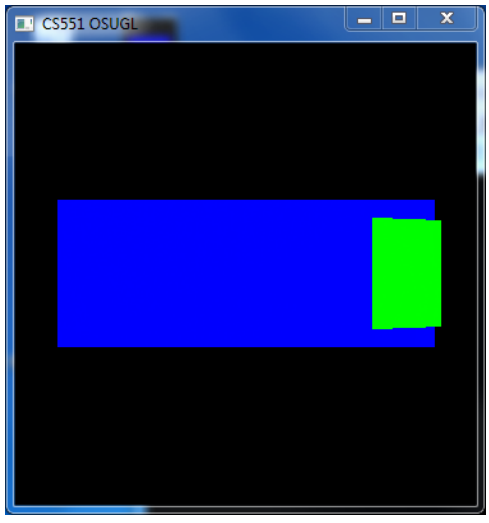
I also think this problem comes from some wrong decision-making sentences, but I don’t think those sentences themselves are wrong. The truly wrong part should be some wrong value of variables due to some calculating error during the program

flow. After another day working on the code, I finally found the part of answer for the whole black image problem I had. I made the checking range of the pixels wrong. I divided the pixel label variables by the weight and height of the plane, and this made those pixels no longer existed in the range of the plane, this is why I got the whole black plane. After I fixed the problem. I finally get something in the image. The following two graphs show the images I had in the fixing progress. The left one is the image I got when I only fix the pixel label variables but not some calculating parts in the following lines in the code. So I only got a triangle but not a polygon. The right one shows what I got when I fix all range problems, and I got a square instead of a triangle. We can also see their exists a little color different between these two images. Since there are all set as pure blue color, I think this is one of the prove that my shade function works fine.





Also, after some little adjustments I have made to the code. I add a “DepthTest” case into the code to check if my zbuffer works fine. Then, I got the image shown below. The image is not looked from the right angle, but it shows that my zbuffer depth works fine. I think the wrong angle may relate to my “osuLookat” function.



Since I am lacking of experience of programming with OpenGL, none of the testing case working with objects worked. The results for those testing cases remain a whole black plane, and I think I can do nothing about them in a short time, so I decided to leave them in the code.

2. A discussion of possible enhancement of your program.

There surely have a lot of things that can be improved in my program. The very first thing is that I pretty much wrote the whole code in one single file, and this makes my code kind of hard to read. To develop it, I can separate my code into different files and combine them together to get the program also runs perfectly. However, it takes time, and time is what I didn't have.

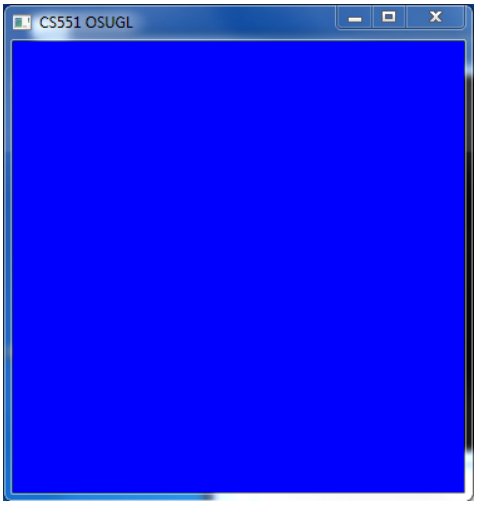
The second thing is I also wrote some part of the code repeated for several times. I could write them separated as another function, and call them when I want to use. However, I still didn't have enough time to fix it. I could just leave them in the code even though they are not necessary in that way and really make the code hard to read.

The third thing is that I left some useless functions in the code. These functions come from previous two assignments and I just copy and paste them into this one. At the beginning of coding this homework, I didn't have a really clear idea about which functions from the past should be used into my program. So I copied almost every thing in order to make sure that I don't miss something important. After I finish the coding part, I realized that there are some functions in the code that I didn't use, but I don't have enough time to figure them out one by one and remove them. So I just left them in the code due to the fact that they won't affect the performance of the code, but they do make the file larger than it should be.

The last and the biggest thing is that my code doesn't turn out right results. Just as the above picture shows, in some cases my code print nothing on the plane. Also in some other cases, the code prints the whole plane into blue, just like the picture shows below. The below result comes from the testing case named "bluecube". My code needs a huge improvement to get everything right. However due to I've already submitted this homework lately, I decide to make some improvement happen in third day after the due date and also have to leave some problems in the code.

Just as what I discussed in the previous paragraph. Even though my code can plot something on the plane right now, they are not quite right. However, they at least can prove that some of the important function in my code works fine. As for the

reason why those images are not right, I think it relates to some other functions in my code. And none of the testing case working with objects turned out to be right. I think this probably relate to the fact that this is my first time working with objects and totally have no idea how to get them right. So I left this part of problems in my code and they could be a huge enhancement.



3. Summary

The biggest problem I have in this assignment is the time. Since there is a midterm from another class and I had a bad time management, I am not able to start to work with the assignment till one day before it is due. So I have to spend more time on it and get the late submit penalty. Today is the third day after the due date, but there is still a lot problems remain in my code. Although I fix some problems in the program in order to let my code plot some real thing, there are still a lot problems remain in the program, especially the objects part. So I decide to submit it and try to fix them after I get more knowledge about them in the future. My code can run successfully, but it cannot give me the right plot. I think the problem hides in the details in the code, such as the value of some variables used in decision-making. However my code does show some evidence to prove that my zbuffer depth function and shades part works fine. Hope I will be able to get them all right in the future.