

CS380

Programming Assignment #1

Due **Mar. 14th (Thu.)** (before 11:59pm)

Difficulty: Easy

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Objective: Understand a compilation and basic structure of a simple OpenGL code.

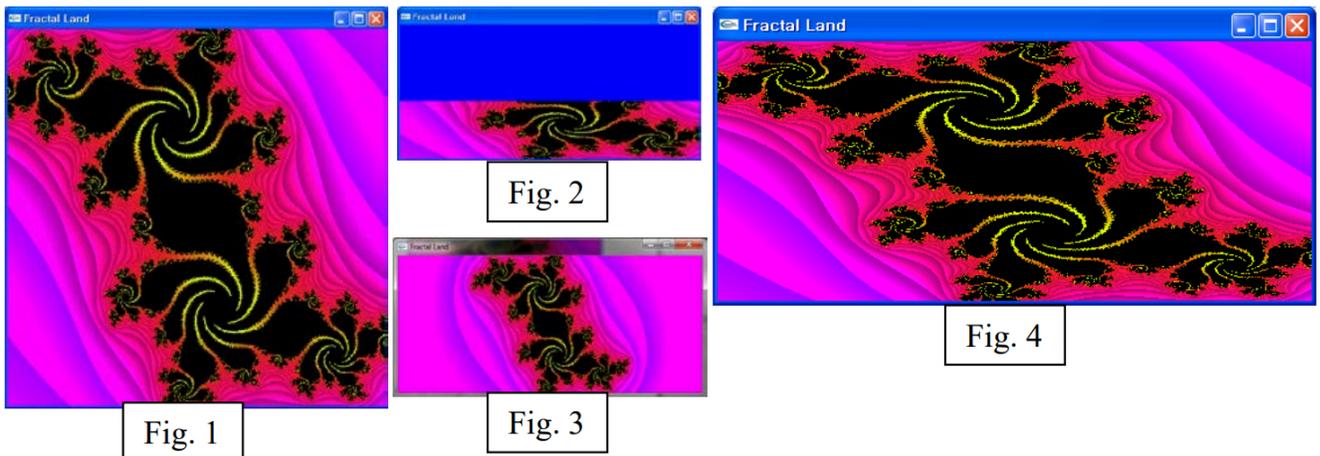
Development environment: Visual Studio 2022 (MSVC v143) in Microsoft Windows (TA will test your code in this environment).

Prerequisites:

- 1) Compile and run the sample code of PA1.cpp.
- 2) Understand the basic OpenGL code structures, including header files, libraries, main, and various call-back functions.
- 3) Comment out the line 184-187 of reshape() function of the PA1.cpp and run again.

Problems:

- 1) Make the PA1 skeleton code to run properly when we resize the window. More specifically speaking, suppose that you have the original windows shown in Fig.1 when you started the program. Then, make the window to have half of the original height like the one shown in Fig. 2. As you can see, only half of the window is filled. But, we would like to utilize all the screen space, as shown in Fig. 4. To achieve this, adequately modify the display() function. There is an assumption on using the variable “delta.” No other function needs to be modified. (10 pts)



- 2) What is the significant difference between the original reshape() function and the modified functions (reshape() and display()) in terms of the functionality? Describe each function(s) and explain the differences. (2.5 pts)
- 3) The original program (i.e., the one produces Fig. 3) and the modified program (i.e., the one produces Fig. 4) serve different purposes. Given their convenience, which one do you prefer and why? (2.5 pts)

Deliveries:

- 1) Binary (*.exe) and source codes (*.cpp) of your solutions for Prob.1 (Fig. 4).
- 2) A report (*.pdf) which contains your **edited display()** function (E.g., void display() { }) and **execution results** for Prob.1 and answers for the Prob. 2 and 3.
(Note: Capture and attach your three execution results of Prob.1 like Fig.1, 2, and 4.).
- 3) Submit your work in KLMS. You should submit a zip file that contains your binary(*.exe), source codes (*.cpp), and your report (*.pdf).
(Note: Name the zip file to **studentID_PA1.zip** (e.g., 20150720_PA1.zip).)

Policies:

- 1) Everyone must turn in their assignment. You can collaborate with others, but any work that you turn in should be your own.
- 2) **If your zip file name does not match the format (i.e., studentID_PA1.zip), we will deduct your score by 2 points.**

FAQ:

- 1) Does the macOS allow?
 - a. We will test your code in MS Windows. No matter what OS you use, you need to make your executable file (*.exe) run on Windows. Thus, we highly recommend you to use Windows. You may want to use Boot Camp in MacOS.
- 2) What do the 'original' reshape() and the 'modified' reshape() mean?
 - a. The 'original' reshape() means the reshape function that you can immediately find in the PA1.zip in KLMS, and the 'modified' reshape() indicates the reshape function modified as directed by prerequisites.
- 3) My executable file is extremely slow! What's the problem in my file?
 - a. If you build your code on 'DEBUG' configuration, then change it to the 'RELEASE' to achieve some acceleration. Google how to do that. However, this is not mandatory.
- 4) 'The program can't start because ~ is missing' error occurs!
 - a. The easiest way is to copy the missing .dll file to the same folder as your EXE.
 - b. Or, go project properties -> Configuration Properties -> Debugging -> Environment -> put 'PATH=%PATH%;<path to glut32.dll directory>' (e.g., PATH=%PATH%;C:\GLUT)
- 5) 'LNK2026: ~ SAFESEH image' error happens!
 - a. Set project properties -> Linker -> Advanced -> Image Has Safe Exception Handlers -> No (/SAFESEH:NO)
- 6) 'Fatal error C1083 ~ 'corect.h'' error occurs!
 - a. <https://codingcoding.tistory.com/867> (Korean)
- 7) Does 'A report (*.pdf) has your edited codes~~' mean that I should contain the modified display() part or the entire code?
 - a. Only the edited part. The edited portion of the display() (and the comment of the reshape(), of course) would be relatively much smaller than the entire code. Thus, if students attach the whole code, it will be hard to read for TAs. So only adding the modified parts (+- about five lines) of display() and reshape() is enough.
- 8) How to test whether my single executable file works well in TA's environment?
 - a. To test whether your executable file works well or not, make a new directory and put the entire related files in the directory. 'Related files' involve glut.dll, glut.lib, glut32.dll, glut32.lib for PA1. For PA2, that involve these four glut files and camera.obj, and cow.obj. Also, put your executable file in the directory then execute .exe file. Your executable will automatically search the library in the directory it belongs to. In Windows, an executable(.exe) which needs a shared library (.dll) can be run when the .exe and .dll files are in the same directory.