Assignment 1 Computer Graphics

In this assignment you will implement image filters using C++ and OpenGL course engine. The input is a 8-bit **.jpg** image which will be located in the project folder (same directory of the cpp file).

Compiling the Engine:

1. Clone the engine using the link on the course site
2. Open Cmake gui and enter the folder of the project you clone and the name of the build directory (you can call it build in the same folder)
3. Press Configure and after it finished press configure again.
4. Press Generate. If there is no error your project is ready.
5. Open your compiler and compile Game project (in Visual Studio you can find Game project in the solution explorer and set it as a startup project).

You need to implement the following image processing tasks:

1. Read the image to a one dimensional array (of unsigned byte).
2. Open a window of size 512x512 [pixels^2] and divide it to 4 squares using different **Viewports.**
3. The up-left square shows the image in gray-scale (without considering the color table).
4. The up-right square shows the "edges" image (each pixel has value of 0 (black) or 255(white)) use **Sobel** operators.
5. The bottom-left square shows **halftone** pattern according to the last slide in lecture 2 (each pixel became 4 pixels in the new black and white picture).
6. The bottom-right square implements **Floyd-Steinberg Algorithm,** which changes the image from 256 intensity grayscale values, to 16 intensity grayscale values.
7. Create 3 text files for subsections 4-6. Each file will contain just numbers separated by commas (without spaces). The numbers will represent the pixel values (0-1 for black and white picture, and 0-15 for grayscale picture). The names of the files will be**: img4.txt, img5.txt, and img6.txt**. These files will be generated in the project/assignment folder.

Submission:

Submit a file with a link to your git repository and short explanation about the changes you did in the engine (files you change and functions you modify). Zip your file. The zip file name must include your ID numbers as follows: **ID1_ID2.zip**

Output example:

For lena256.jpg