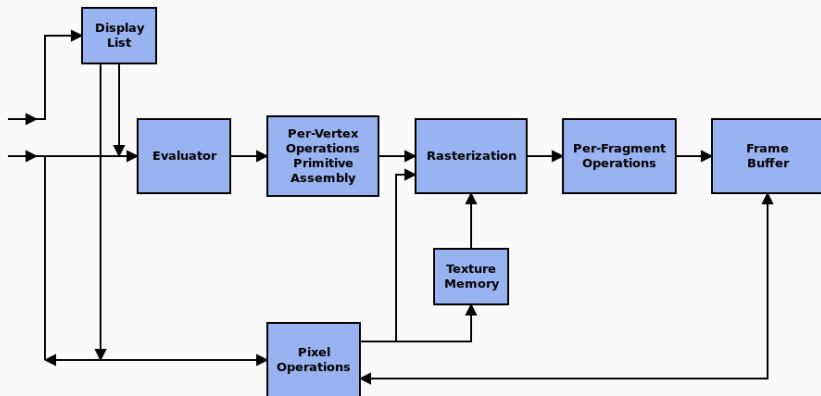




OpenGL Pipeline

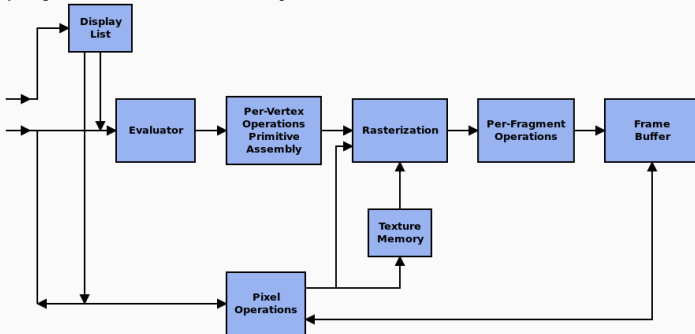
- The OpenGL pipeline takes each vertex through a series of stages.



Source : https://commons.wikimedia.org/wiki/File:Pipeline_OpenGL.svg

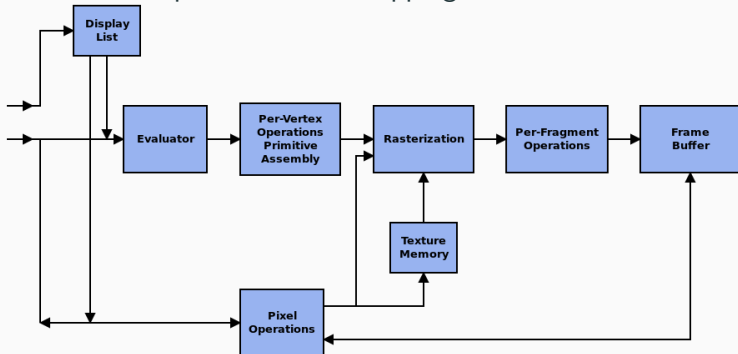
OpenGL Pipeline i

1. Pre-Vertex Operation : Vertices are processed by the Vertex Shader. Transformation from 3D coordinate system to projective coordinate system.



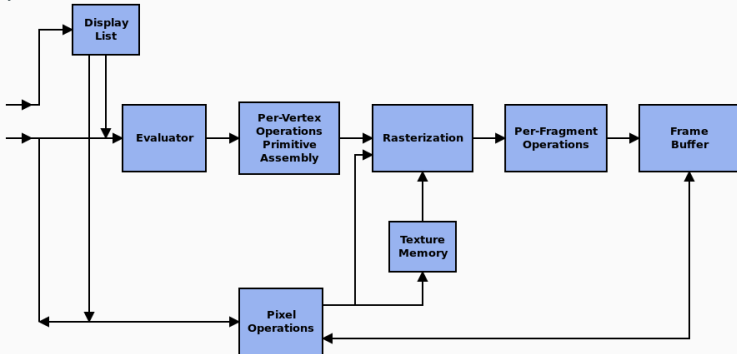
Source : https://commons.wikimedia.org/wiki/File:Pipeline_OpenGL.svg

- Primitive Assembly : Primitives are constructed by connecting vertices in a specified order. Clipping occurs as well.



Source : https://commons.wikimedia.org/wiki/File:Pipeline_OpenGL.svg

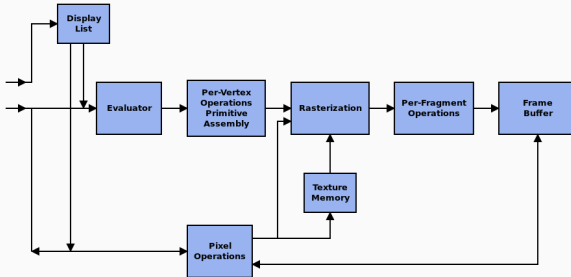
3. Rasterization : Select pixels that approximate the shape of a primitive.



Source : https://commons.wikimedia.org/wiki/File:Pipeline_OpenGL.svg

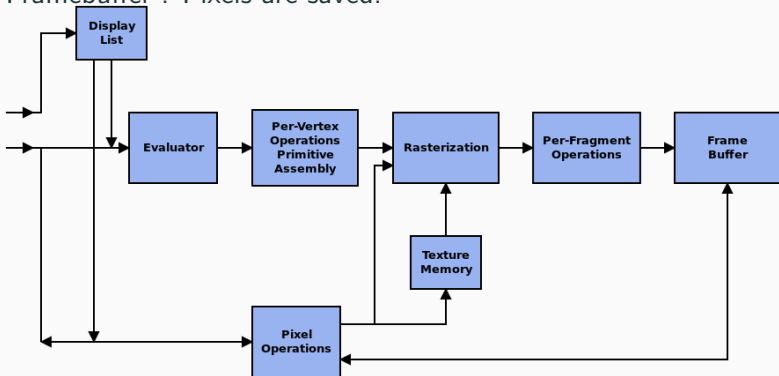
4. Per-Fragment Operations :

- 4.1 A fragment is a set of pixels approximating the shape of a primitive. A fragment shader applies colour or texture to pixels within a fragment.
- 4.2 A number of tests are also performed on fragments (pixel ownership test, scissor test, alpha test, ...).



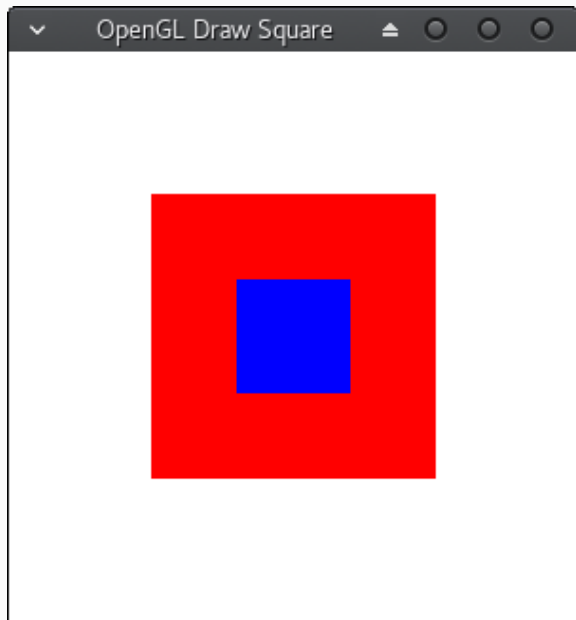
Source : https://commons.wikimedia.org/wiki/File:Pipeline_OpenGL.svg

5. Framebuffer : Pixels are saved.

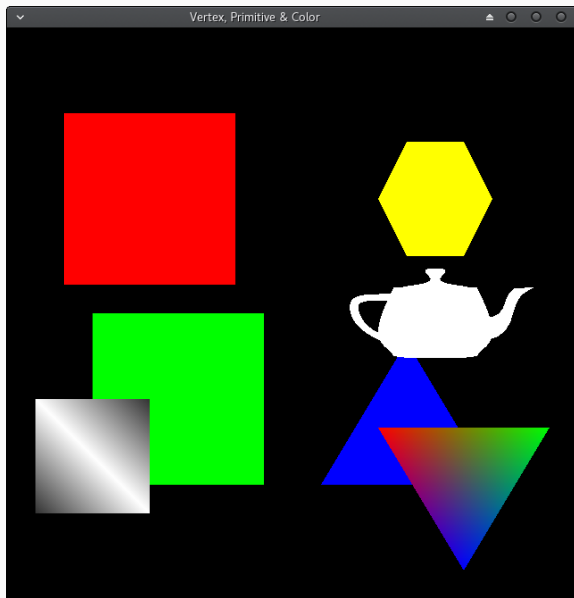


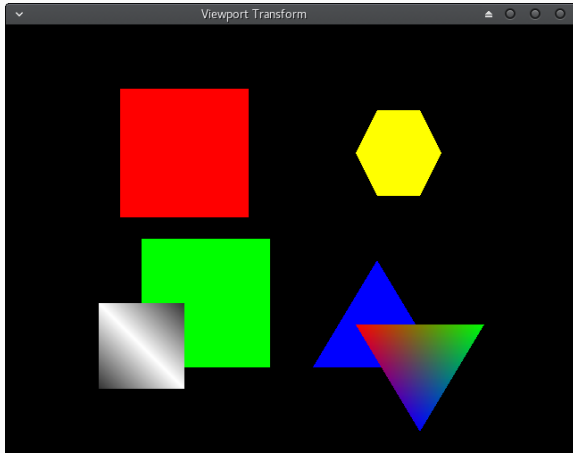
Source : https://commons.wikimedia.org/wiki/File:Pipeline_OpenGL.svg

- OpenGL Utility Toolkit (GLUT) implements a simple windowing system API.
- Considerably easier to learn about and explore OpenGL programming.
- Designed for constructing small to medium sized OpenGL programs.

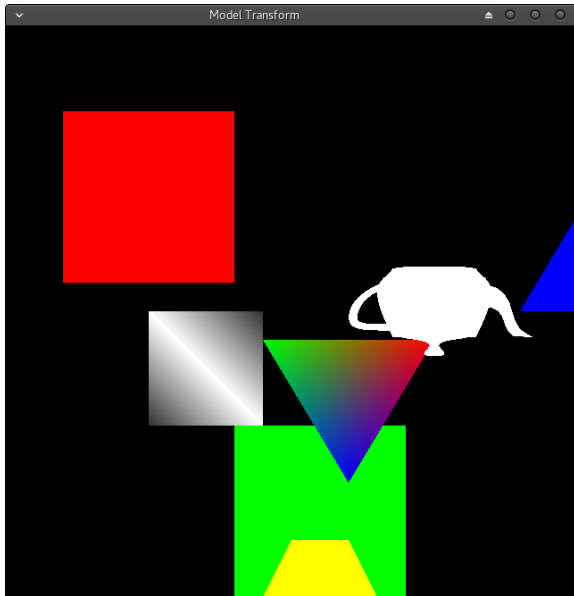


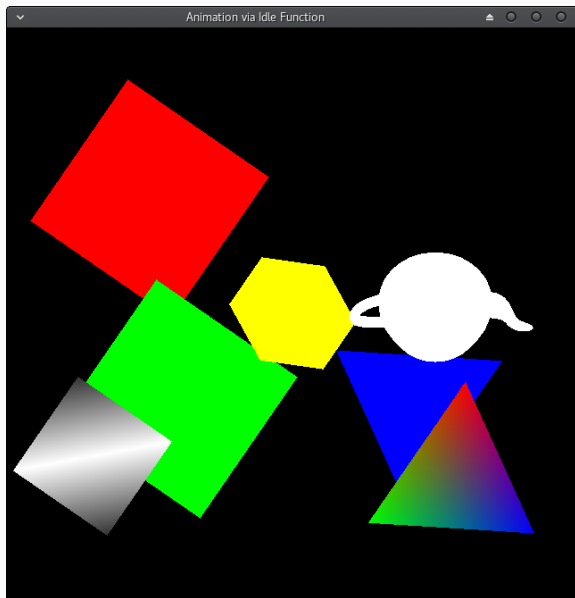
opengl_2d_drawShapes.c



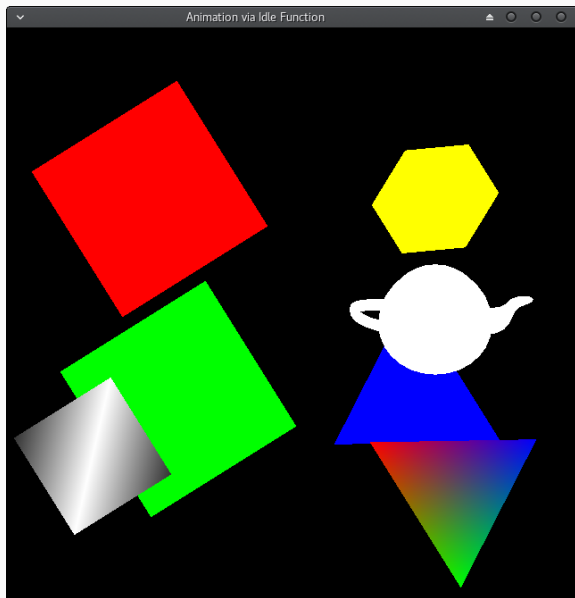


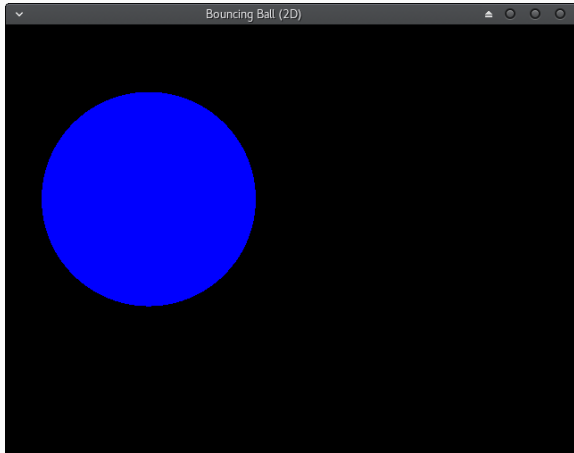
opengl_2d_translateRotate.c

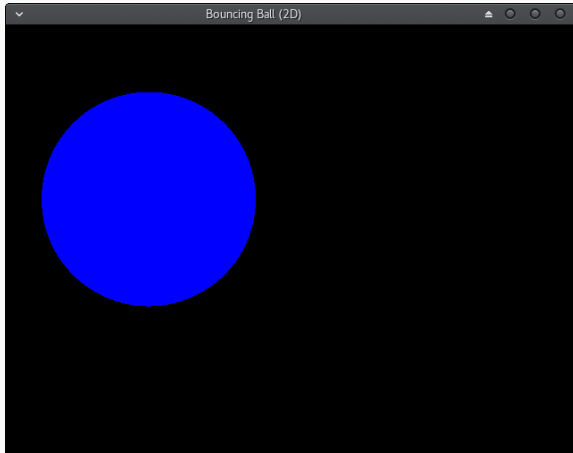


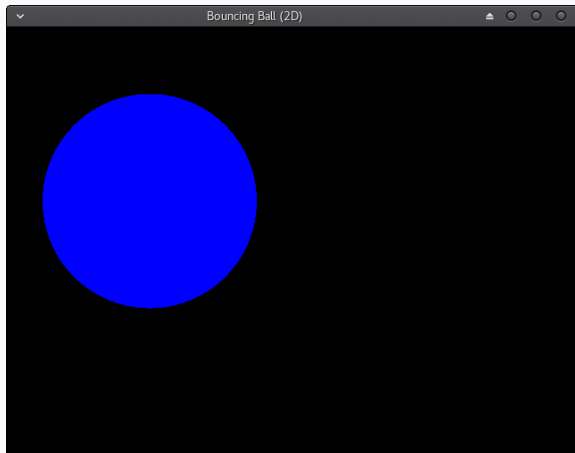


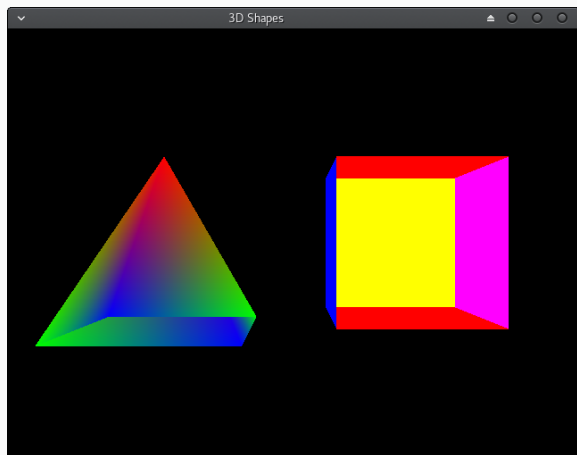
opengl_2d_translateRotateAnimationTimer.c

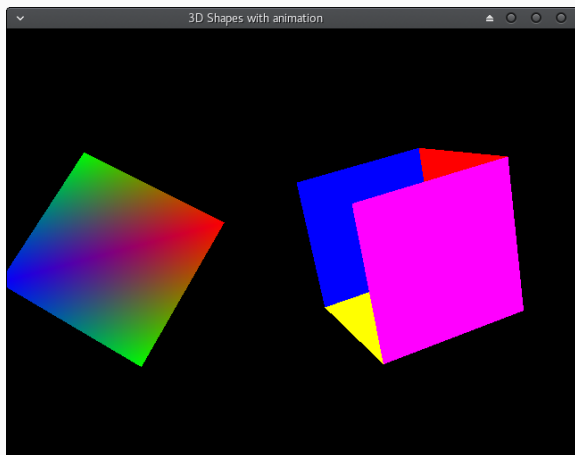




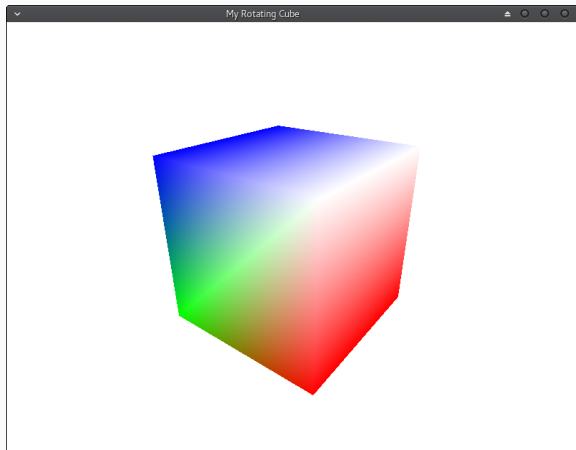




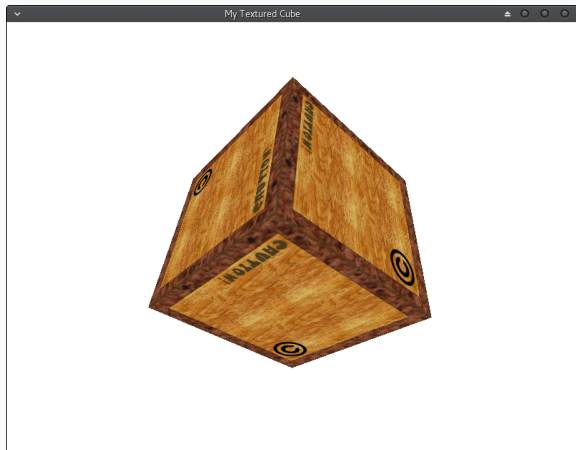




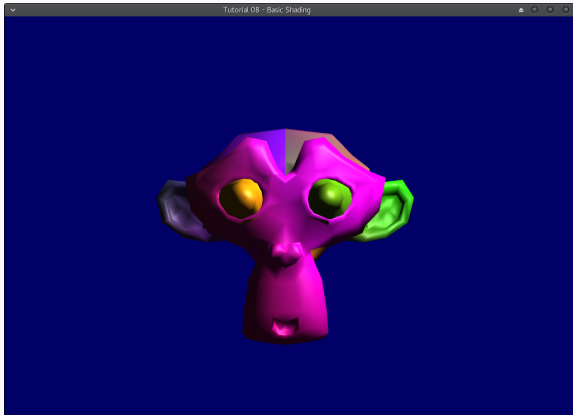
texture_tutorial
tut05_cube
cube.cpp



texture_tutorial
tut06_textures
cube.cpp



ogl-master
tutorial08_basic_shading
tutorial08.cpp



- http://www3.ntu.edu.sg/home/ehchua/programming/opengl/cg_introduction.html
- https://en.wikibooks.org/wiki/OpenGL_Programming#Basics
- <http://www.haroldserrano.com/articles/>
- <https://www.opengl.org/sdk/docs/tutorials/>