

Transformation and Basic Animation

In this lab exercise, we will look into how OpenGL transform the objects through fixed function pipelines. Towards the end, you will need to create your first ever animated OpenGL program.

1. **glTranslatef(x, y, z);**

The **glTranslatef()** function will translate the object according to the x, y and z parameters.

- a. Add the function before you called the `glBegin()...glEnd()` block.
- b. Compile and run your program.
- c. Can see your triangle?
- d. Try to change the translation value to an extreme small value, such as 0.0001f.
- e. Observe the result.

2. **glLoadIdentity();**

The **glLoadIdentity()** function will reset the transformation matrix back to the identity.

- a. Call the function before you make the call to `glTranslatef()`.
- b. Now observe the magic.

3. **glRotatef(angle, x, y, z);**

The **glRotatef()** function will rotate the object for the given angle (in degree), in the x-axis, y-axis and / or z-axis.

- a. As we are in 2D world at the moment, test the function with only rotation on z-axis.
- b. Call the function after you make the call to `glTranslatef()`.
- c. Now, try to call the function before you make the call to `glTranslatef()`.
- d. Observe the result.

4. **GL_QUADS**

The **GL_QUADS** is a parameters for **glBegin()**. It specifies a quad (rectangle) to be drawn on screen.

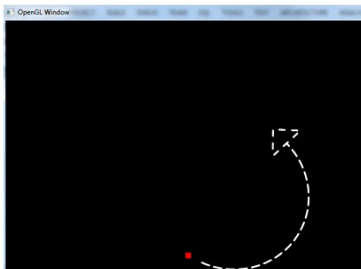
- a. Now draw a quad object after the triangle.
- b. Observe the result.
- c. Hey, I just want to transform my triangle, please put my quad back.

Practical Exercise 2

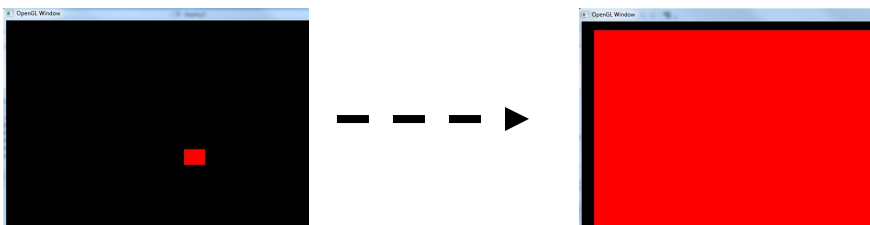
1. Let provide some Interactive method for object in OpenGL
 - a. Press left will move object to left. (0.5 mark)
 - b. Press Right will move object to right. (0.5 mark)
 - c. Press up will move up object. (0.5 mark)
 - d. Press down will move down object. (0.5 mark)
 - e. Press 'R' will change object colour to pure red. (0.5 mark)
 - f. Press 'G' will change object colour to pure green. (0.5 mark)
 - g. Press 'B' will change object colour to pure blue. (0.5 mark)
 - h. Press Space will reset object to white colour, and locate at centre. (1 mark)
2. Create a colour-changing star in OpenGL. The star Object should change the colour automatically without any user interactive. (5.5 marks)

Criteria	Marks
Complexity of graphic	3
Colour changing	2
Extra features	0.5
TOTAL	5.5

3. Create an OpenGL point which moving anti-clockwise. (2 marks)



4. Create an expendable red box which will expend it size automatically. (1 mark)



[TOTAL: 13 marks]