UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
Faculty of Engineering

SCSV4543-02
ADVANCED COMPUTER GRAPHICS
(Session 2020/2021 Semester 2)
School of Computing
Universiti Teknologi Malaysia

ASSIGNMENT 1
3D TRANSFORMATIONS

PREPARED BY

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(Section 02)

INTRODUCTION

In this assignment 1, by using C++ platform and openGL libraries, we produce the required three simple primitive 3D objects to be displayed. We display a cube, a pyramid and a cuboid. The program runs one at a time and no looping function to repeat loading the objects in the same windows output. The program menu will end after displaying output from the user choices and also if the input is invalid.

OUTPUTS

1. Basic Menu interactions which include the input from users. The system colors change to white background and white color for texts.

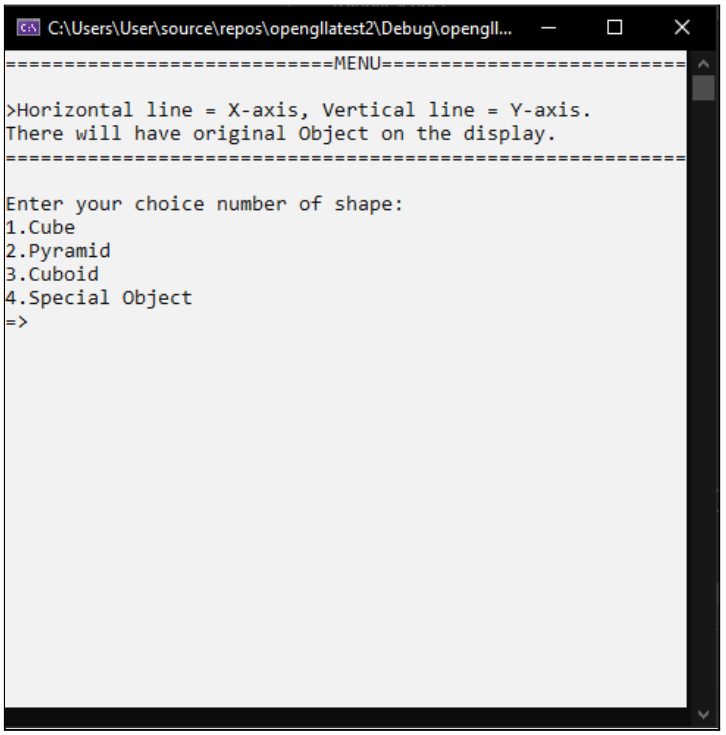
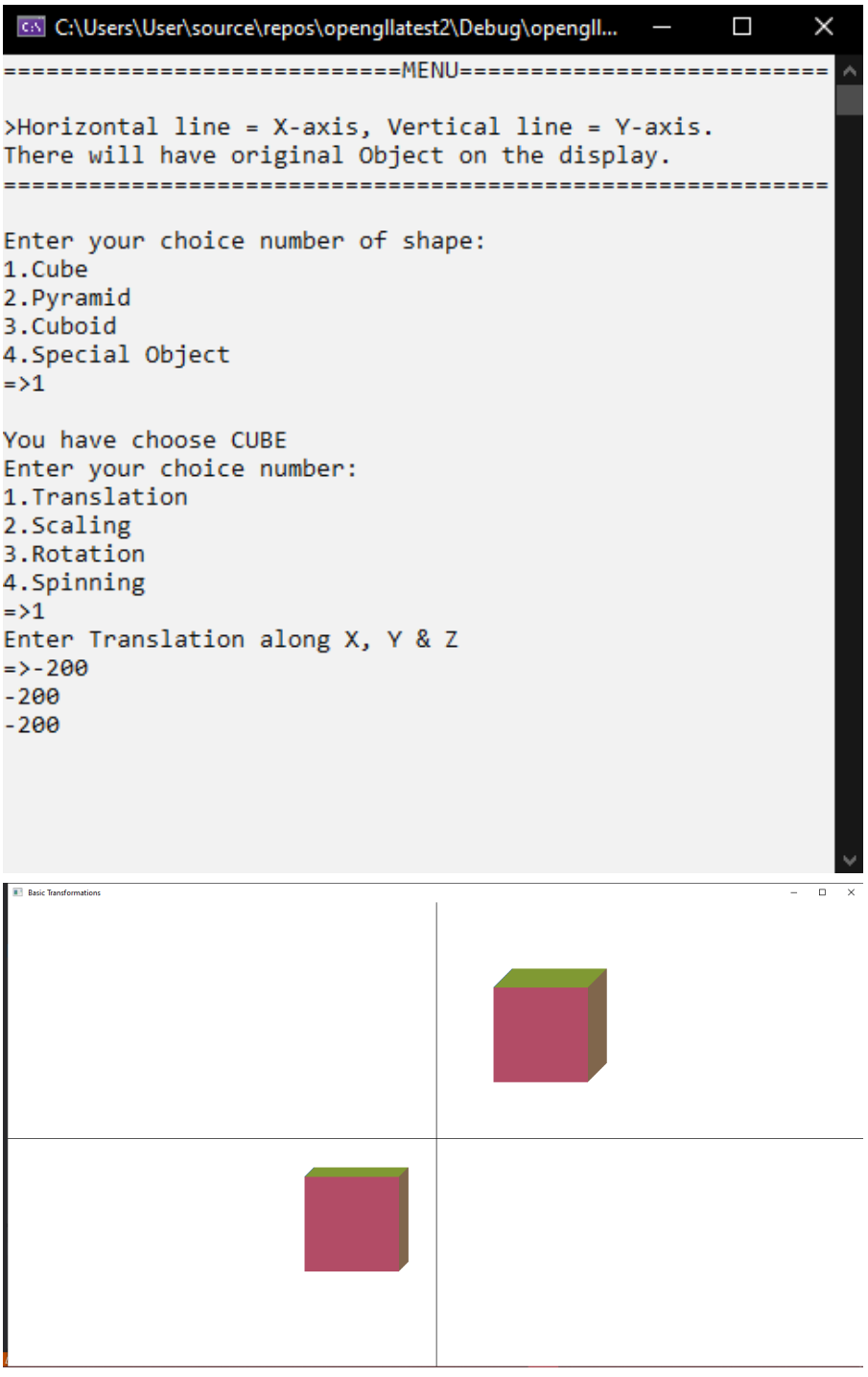
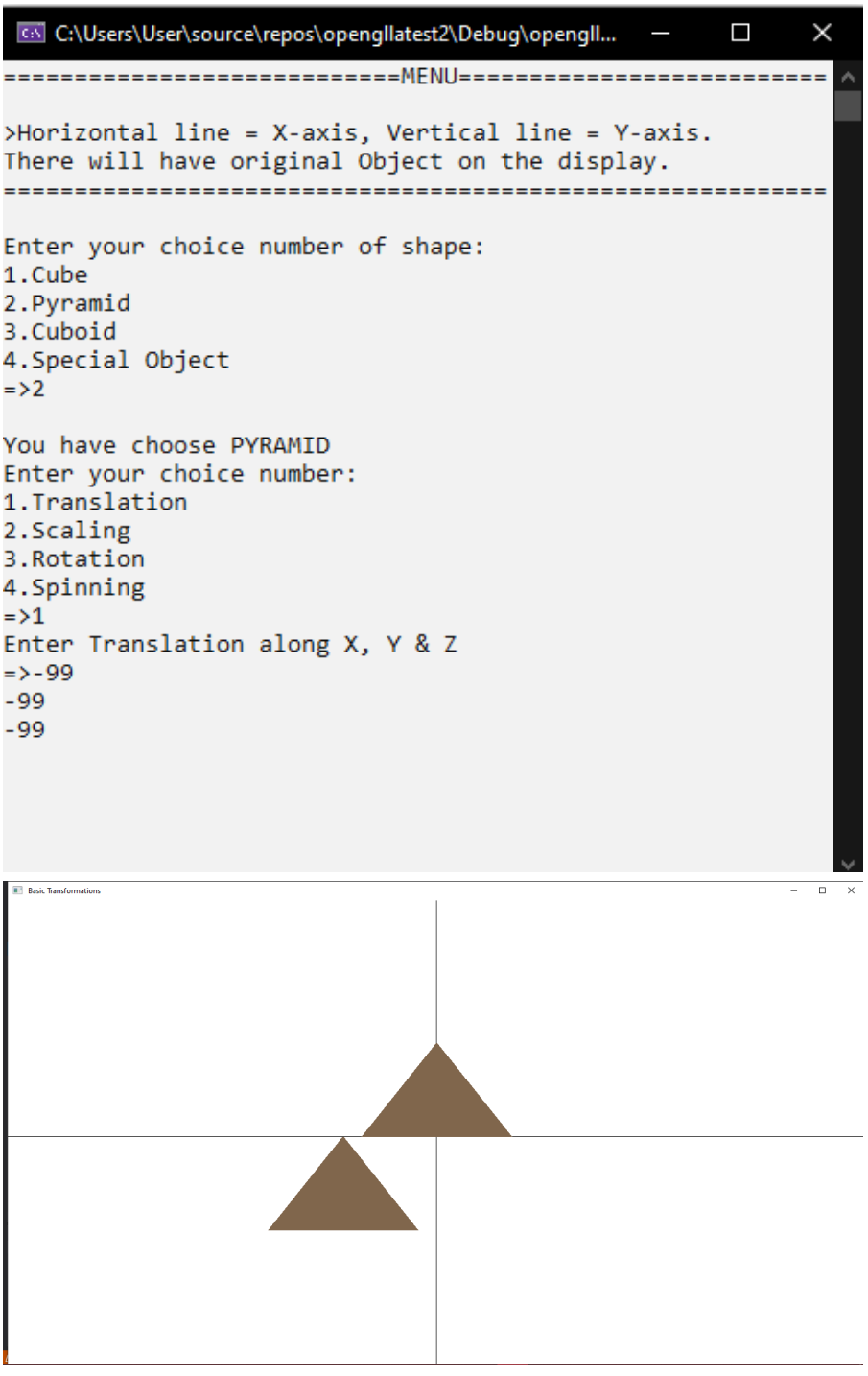


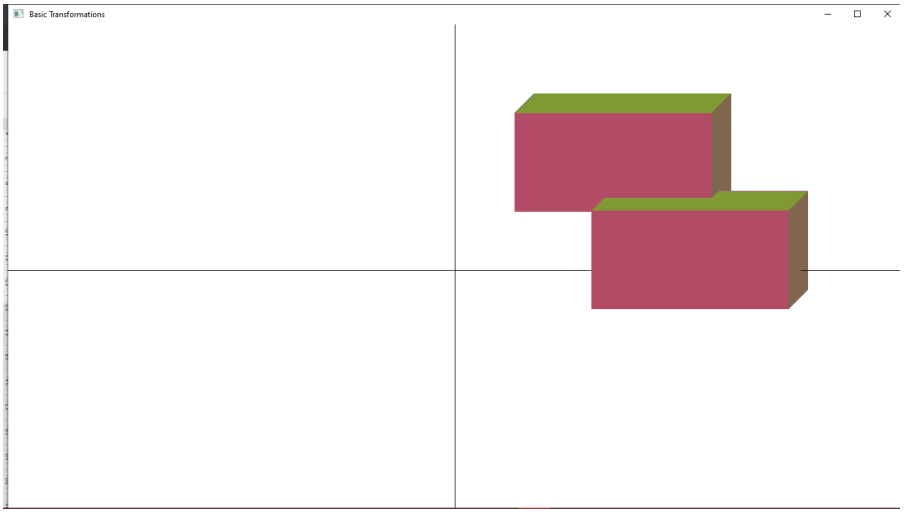
Figure 1 Basic Menu windows.

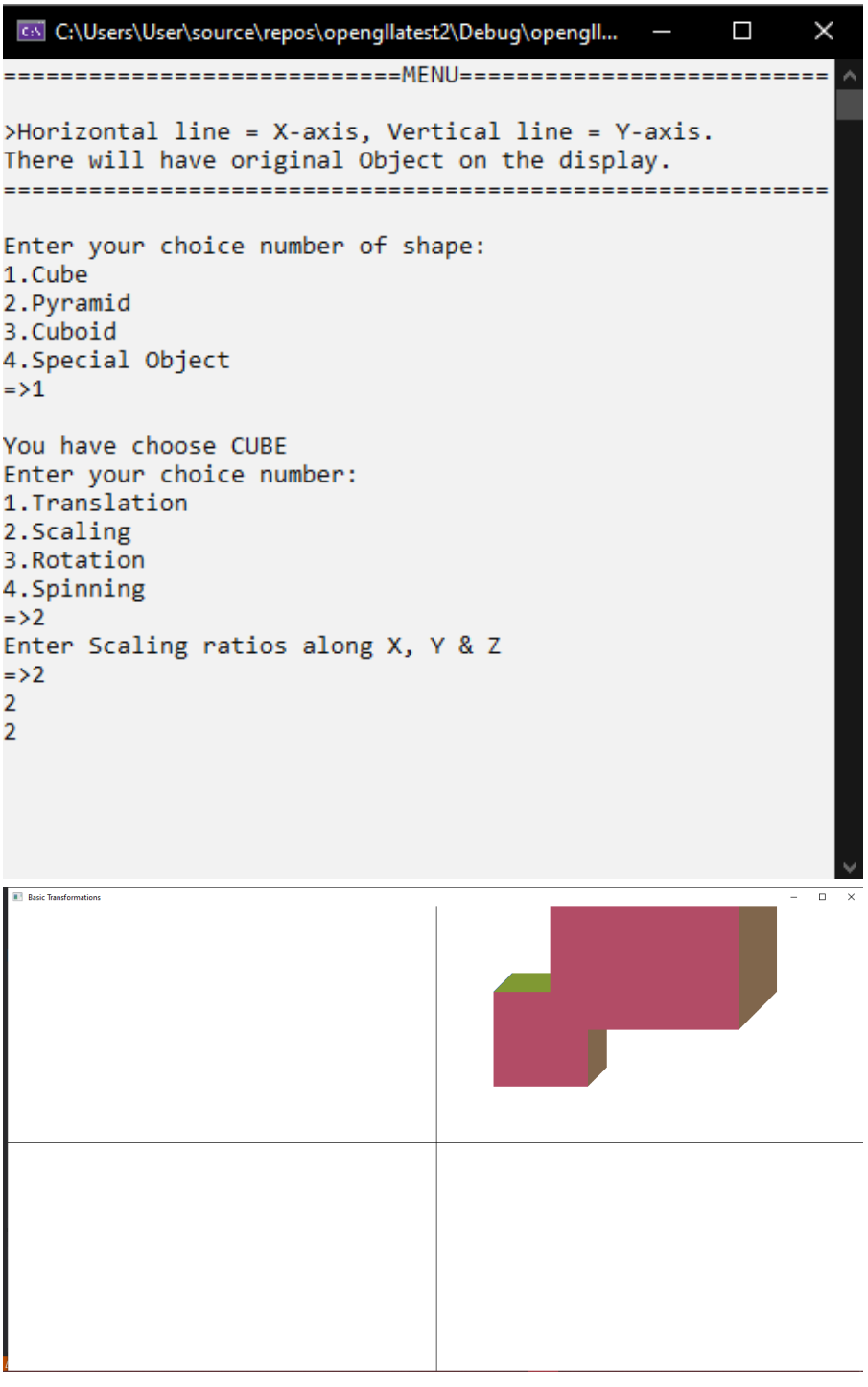
2. The basic and composite 3D geometric transformations techniques for translation, scaling, rotation and spinning for each simple primitive object, which is cube, pyramid and cuboid. There will be a new window for spinning functions.

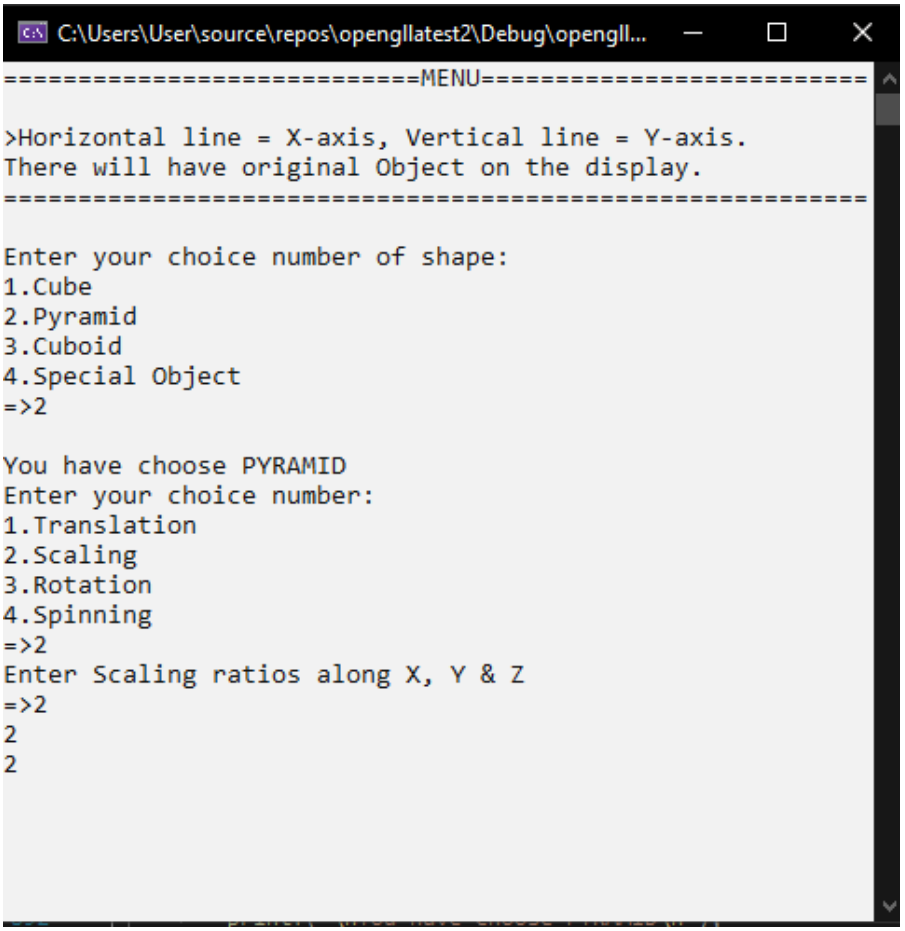
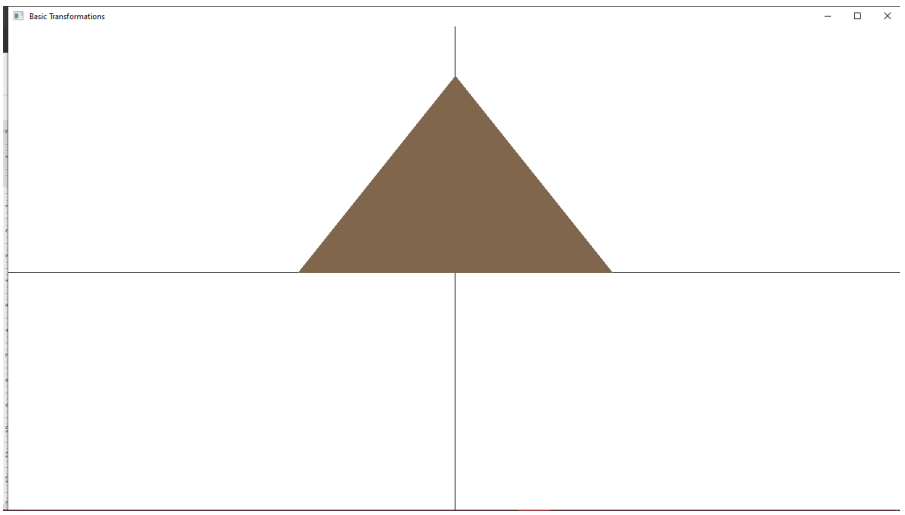
Object	Translation Output
Cube	

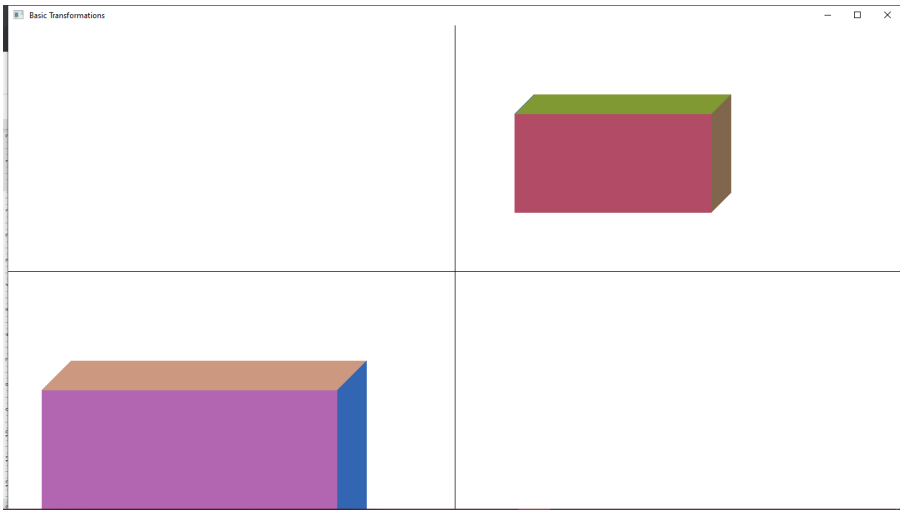
Pyramid	

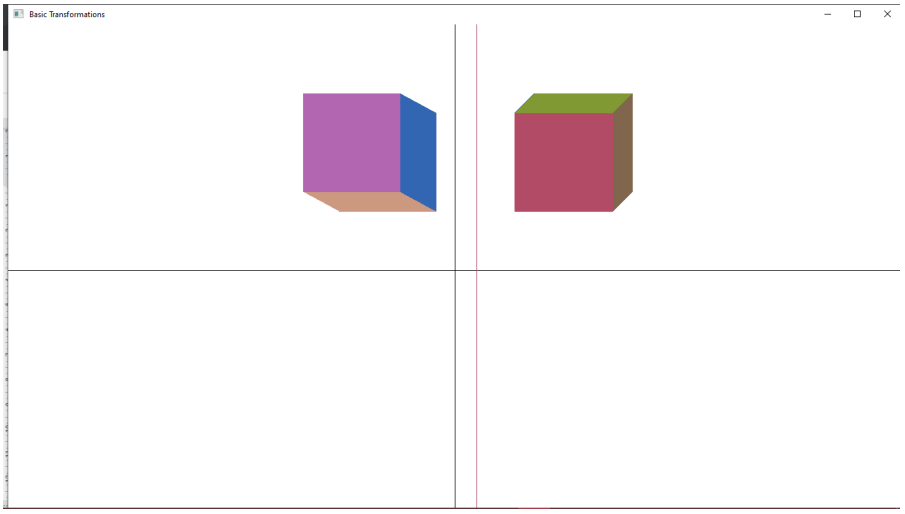
C:\Users\User\source\repos\opengllatest2\Debug\opengll...
==========MENU==========
>Horizontal line = X-axis, Vertical line = Y-axis.
There will have original Object on the display.
==========
Enter your choice number of shape:
1.Cube
2.Pyramid
3.Cuboid
4.Special Object
=>2
You have choose PYRAMID
Enter your choice number:
1.Translation
2.Scaling
3.Rotation
4.Spinning
=>1
Enter Translation along X, Y & Z
=>-99
-99
-99
Basic Transformations

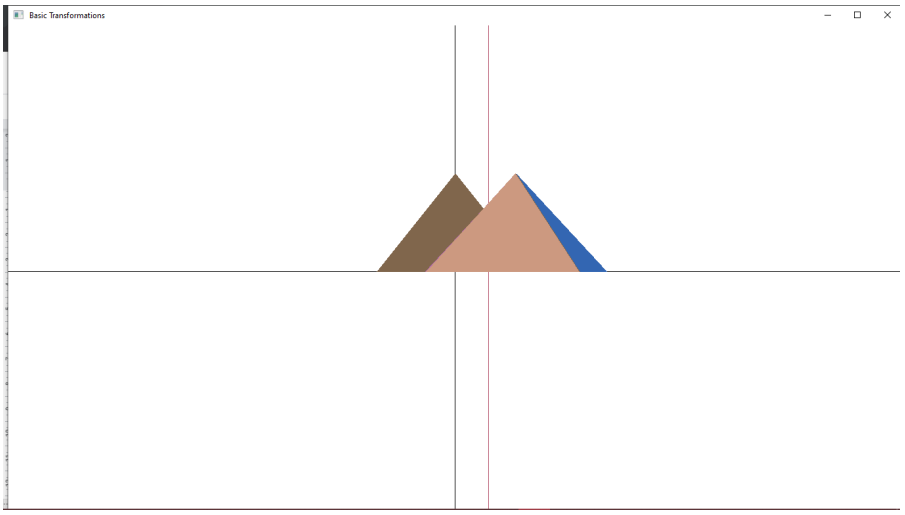
Cuboid	C:\Users\User\source\repos\opengllatest2\Debug\opengll... ==========MENU========== >Horizontal line = X-axis, Vertical line = Y-axis. There will have original Object on the display. ========== Enter your choice number of shape: 1.Cube 2.Pyramid 3.Cuboid 4.Special Object =>3 You have choose CUBOID Enter your choice number: 1.Translation 2.Scaling 3.Rotation 4.Spinning =>1 Enter Translation along X, Y & Z =>78 -99 65 

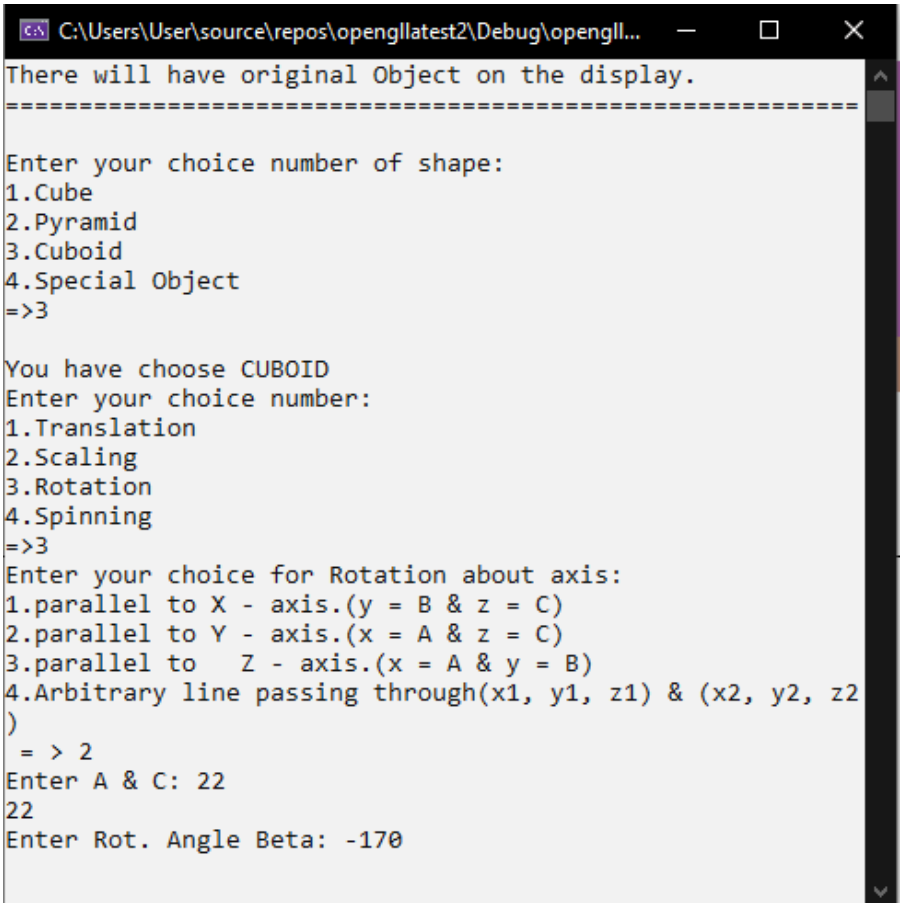
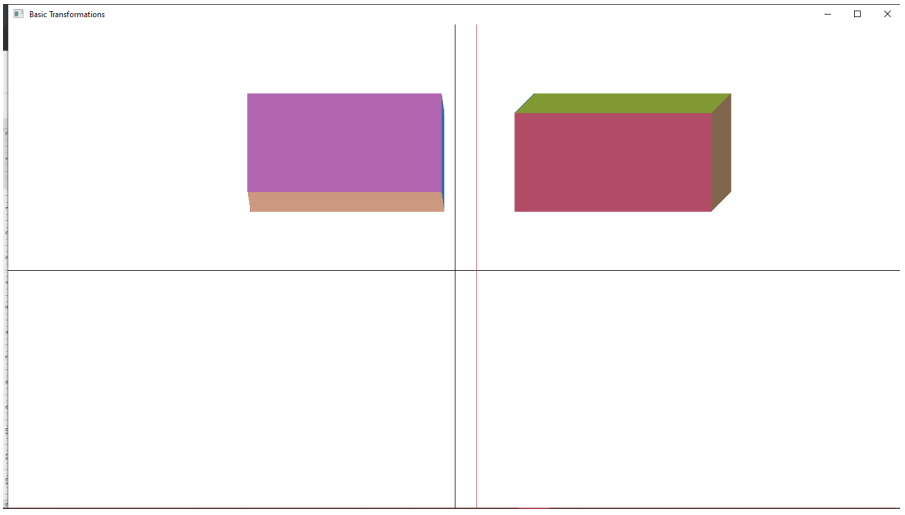
Object	Scaling Output
Cube	

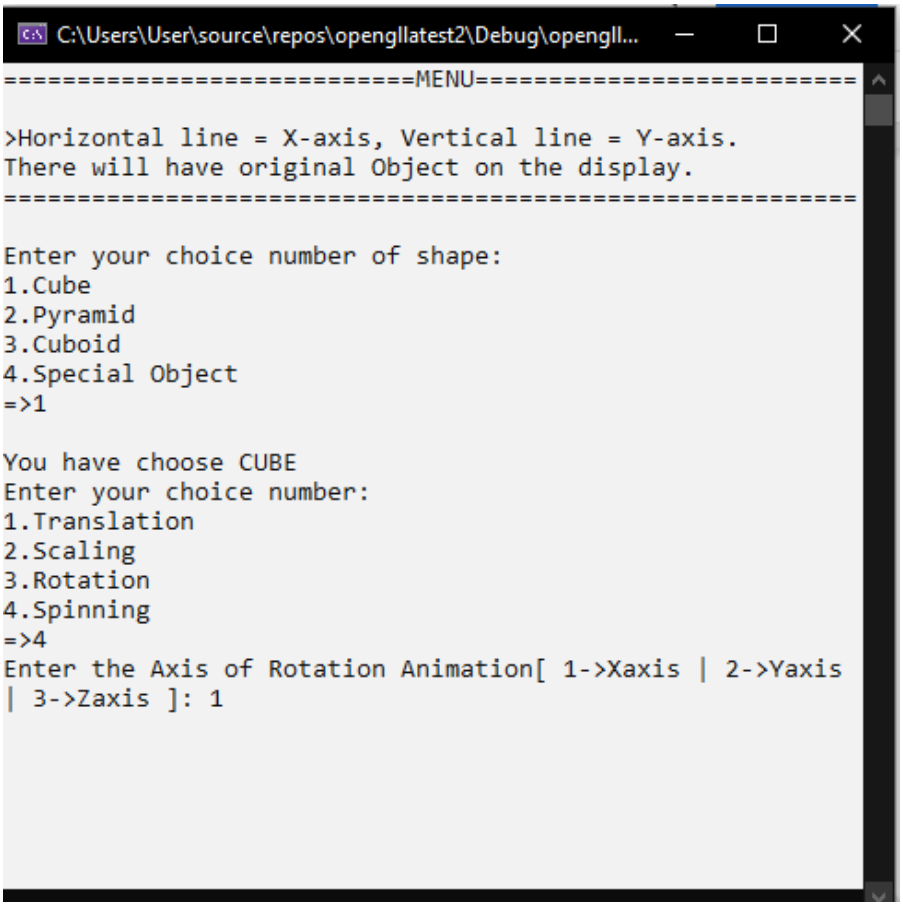
Pyramid	 C:\Users\User\source\repos\opengllatest2\Debug\opengll... ==========MENU========== >Horizontal line = X-axis, Vertical line = Y-axis. There will have original Object on the display. ========== Enter your choice number of shape: 1.Cube 2.Pyramid 3.Cuboid 4.Special Object =>2 You have choose PYRAMID Enter your choice number: 1.Translation 2.Scaling 3.Rotation 4.Spinning =>2 Enter Scaling ratios along X, Y & Z =>2 2 2  Basic Transformations

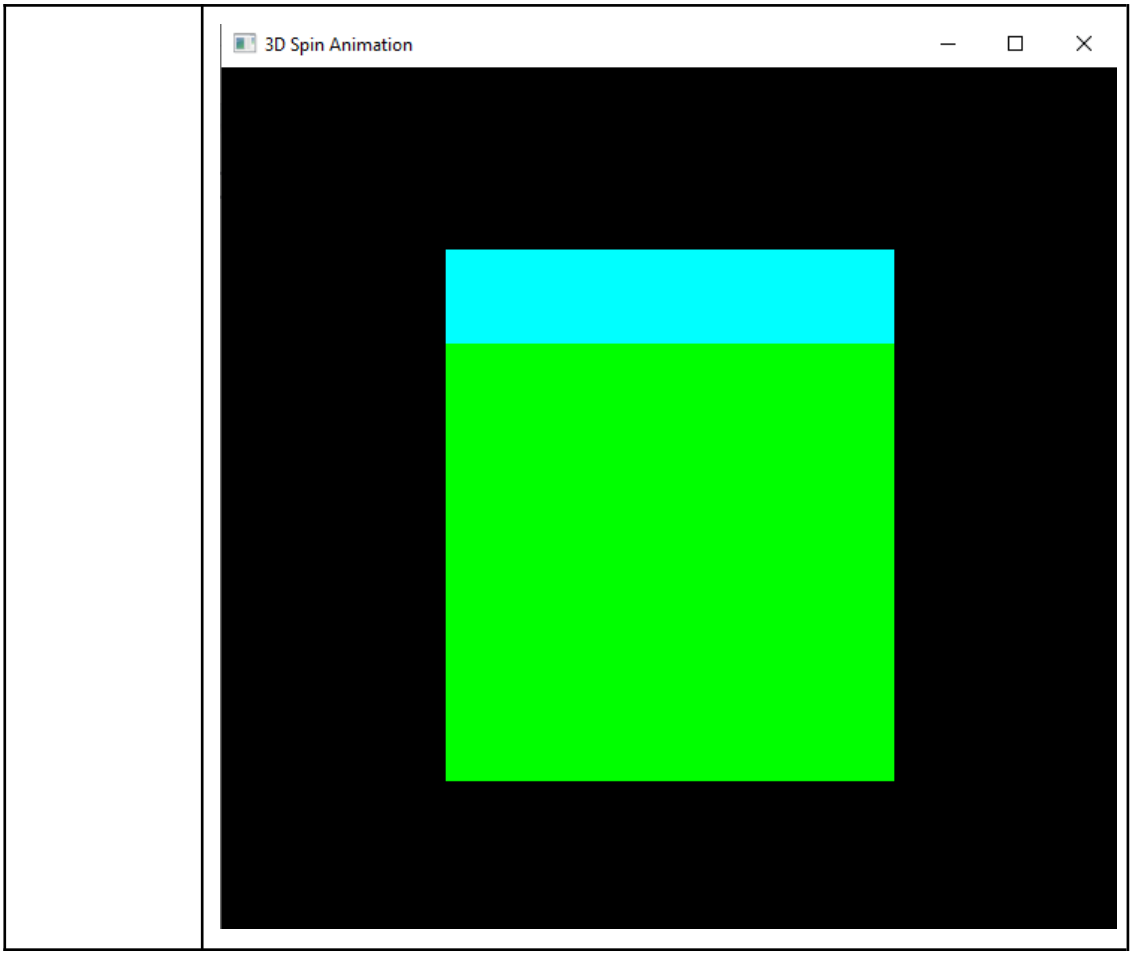
Cuboid	C:\Users\User\source\repos\opengllatest2\Debug\opengll... ==========MENU========== >Horizontal line = X-axis, Vertical line = Y-axis. There will have original Object on the display. ========== Enter your choice number of shape: 1.Cube 2.Pyramid 3.Cuboid 4.Special Object =>3 You have choose CUBOID Enter your choice number: 1.Translation 2.Scaling 3.Rotation 4.Spinning =>2 Enter Scaling ratios along X, Y & Z =>-1.5 -1.5 -1.5 

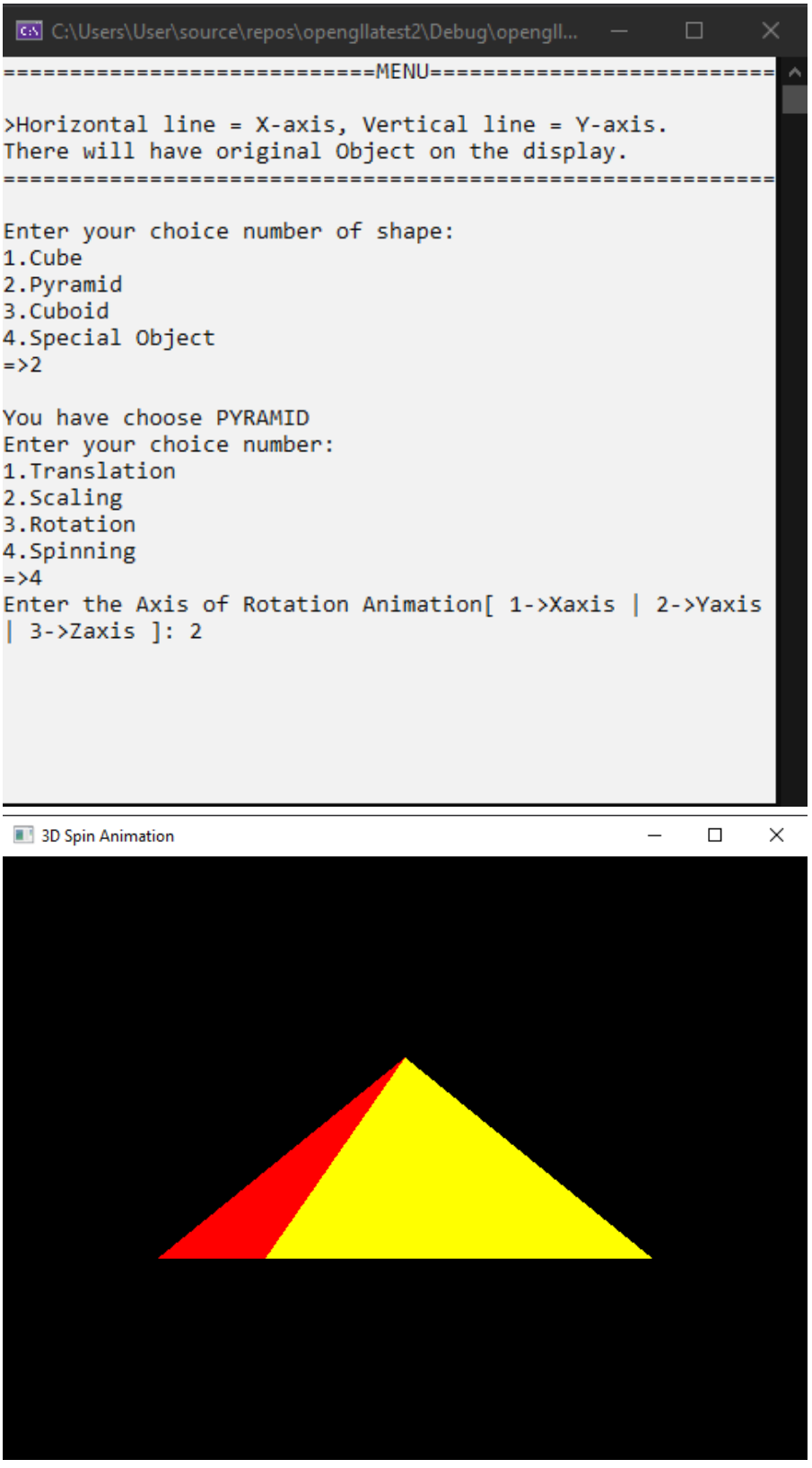
Object	Rotation Output
Cube	C:\Users\User\source\repos\opengllatest2\Debug\opengll... There will have original Object on the display. ========== Enter your choice number of shape: 1.Cube 2.Pyramid 3.Cuboid 4.Special Object =>1 You have choose CUBE Enter your choice number: 1.Translation 2.Scaling 3.Rotation 4.Spinning =>3 Enter your choice for Rotation about axis: 1.parallel to X - axis.(y = B & z = C) 2.parallel to Y - axis.(x = A & z = C) 3.parallel to Z - axis.(x = A & y = B) 4.Arbitrary line passing through(x1, y1, z1) & (x2, y2, z2) = > 2 Enter A & C: 22 22 Enter Rot. Angle Beta: 170 

Pyramid	C:\Users\User\source\repos\opengllatest2\Debug\opengll... There will have original Object on the display. ========== Enter your choice number of shape: 1.Cube 2.Pyramid 3.Cuboid 4.Special Object =>2 You have choose PYRAMID Enter your choice number: 1.Translation 2.Scaling 3.Rotation 4.Spinning =>3 Enter your choice for Rotation about axis: 1.parallel to X - axis.(y = B & z = C) 2.parallel to Y - axis.(x = A & z = C) 3.parallel to Z - axis.(x = A & y = B) 4.Arbitrary line passing through(x1, y1, z1) & (x2, y2, z2) = > 2 Enter A & C: 34 34 Enter Rot. Angle Beta: 170 

Cuboid	 C:\Users\User\source\repos\opengllatest2\Debug\opengll... There will have original Object on the display. ========== Enter your choice number of shape: 1.Cube 2.Pyramid 3.Cuboid 4.Special Object =>3 You have choose CUBOID Enter your choice number: 1.Translation 2.Scaling 3.Rotation 4.Spinning =>3 Enter your choice for Rotation about axis: 1.parallel to X - axis.(y = B & z = C) 2.parallel to Y - axis.(x = A & z = C) 3.parallel to Z - axis.(x = A & y = B) 4.Arbitrary line passing through(x1, y1, z1) & (x2, y2, z2) = > 2 Enter A & C: 22 22 Enter Rot. Angle Beta: -170  Basic Transformations

Object	Spinning Output
Cube	


3D Spin Animation

Pyramid	

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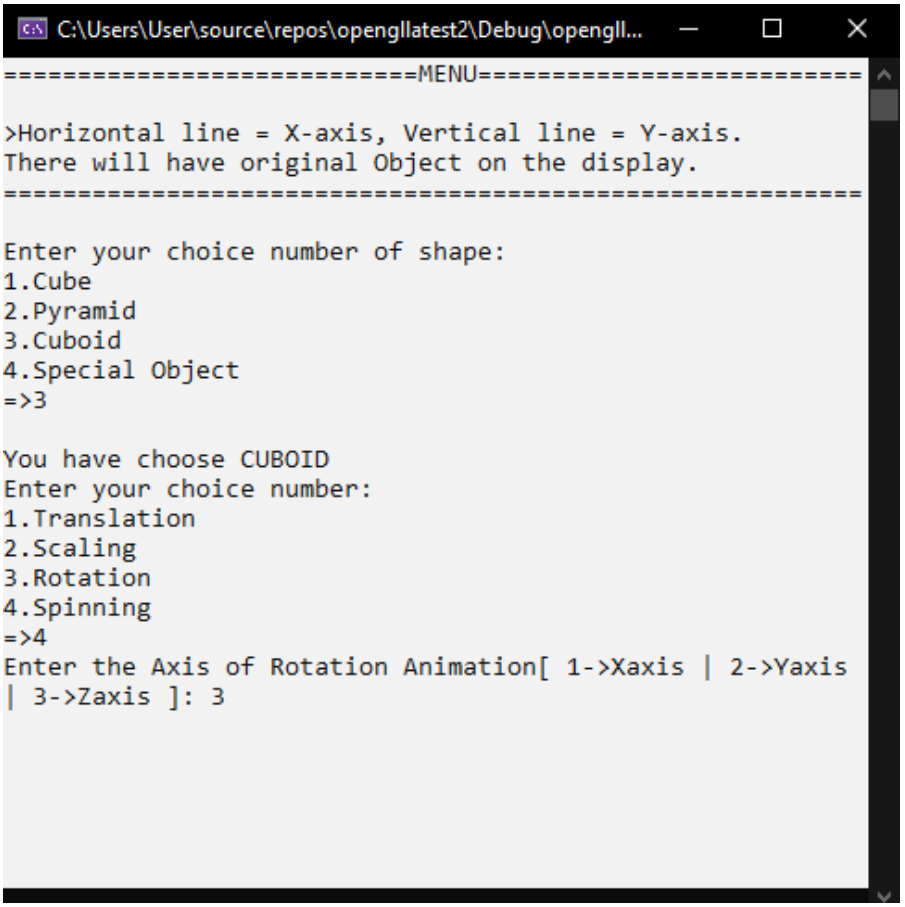
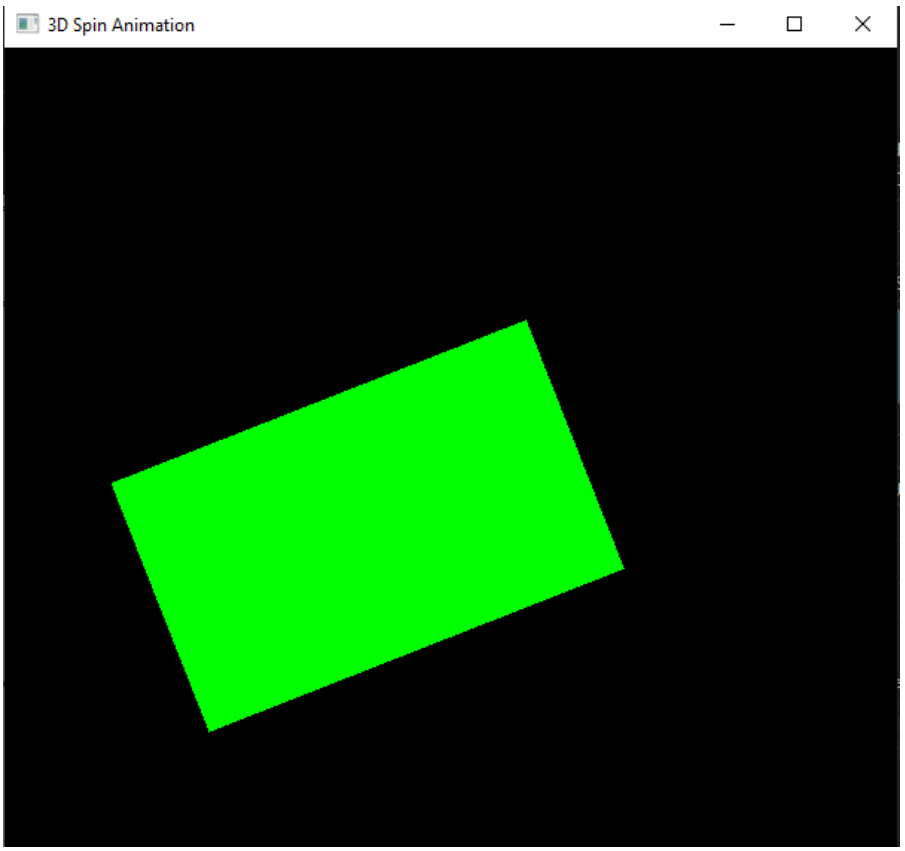
There will have original Object on the display.
==========
Enter your choice number of shape:
1.Cube
2.Pyramid
3.Cuboid
4.Special Object
=>2
You have choose PYRAMID
Enter your choice number:
1.Translation
2.Scaling
3.Rotation
4.Spinning
=>4
Enter the Axis of Rotation Animation[1->Xaxis | 2->Yaxis | 3->Zaxis]: 2
3D Spin Animation

Cuboid	 C:\Users\User\source\repos\opengllatest2\Debug\opengll... ==========MENU========== >Horizontal line = X-axis, Vertical line = Y-axis. There will have original Object on the display. ========== Enter your choice number of shape: 1.Cube 2.Pyramid 3.Cuboid 4.Special Object =>3 You have choose CUBOID Enter your choice number: 1.Translation 2.Scaling 3.Rotation 4.Spinning =>4 Enter the Axis of Rotation Animation[1->Xaxis | 2->Yaxis | 3->Zaxis]: 3  3D Spin Animation