How to compile and run the program:

Step 1:

Open the terminal and go to the unzipped folder (Rotate-Sphere)

Step 2:

Run the commands below to generate the Makefile ($ stands for the terminal prompt).

Note that the folder already had the build file as well as sphere.8 and sphere.128 in it, so you may skip the below steps and go to the build folder directly.

$mkdir build
$cd build
$make

Step 3:

To run the program in the command line below, then type in the file name when prompted:

$./RotateSphere

```
[(base) zijing@MacBook-Pro ~ % cd /Users/zijing/Desktop/Graphics/Rotate-Sphere
[(base) zijing@MacBook-Pro Rotate-Sphere % cd build
[(base) zijing@MacBook-Pro build % make
[ 33%] Building CXX object CMakeFiles/RotateSphere.dir/rotate-sphere.cpp.o
[ 66%] Linking CXX executable RotateSphere
[100%] Built target RotateSphere
[(base) zijing@MacBook-Pro build % ./RotateSphere
what filename? sphere.128
Renderer: Apple M2 Max
OpenGL version supported 4.1 Metal - 83.1
Successfully read vshader42.glsl
Successfully compiled vshader42.glsl
Successfully read fshader42.glsl
Successfully compiled fshader42.glsl
Successfully linked program object
```

We can see that the sphere standing still with center at point A initially.
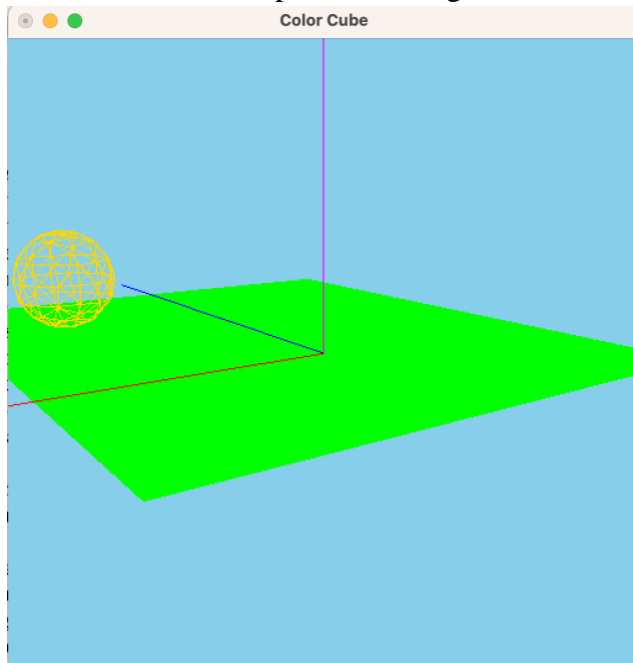
We can start rolling the sphere by hitting the 'b' or the 'B' key. Also, the 'x' and the 'X' keys will decrease and increase the viewer x-coordinate by 1.0, and similarly for the viewer y- and z-coordinates (with 'y', 'Y', 'z' and 'Z' keys). The left mouse button is associated with a menu, which has two entries and is shown below.
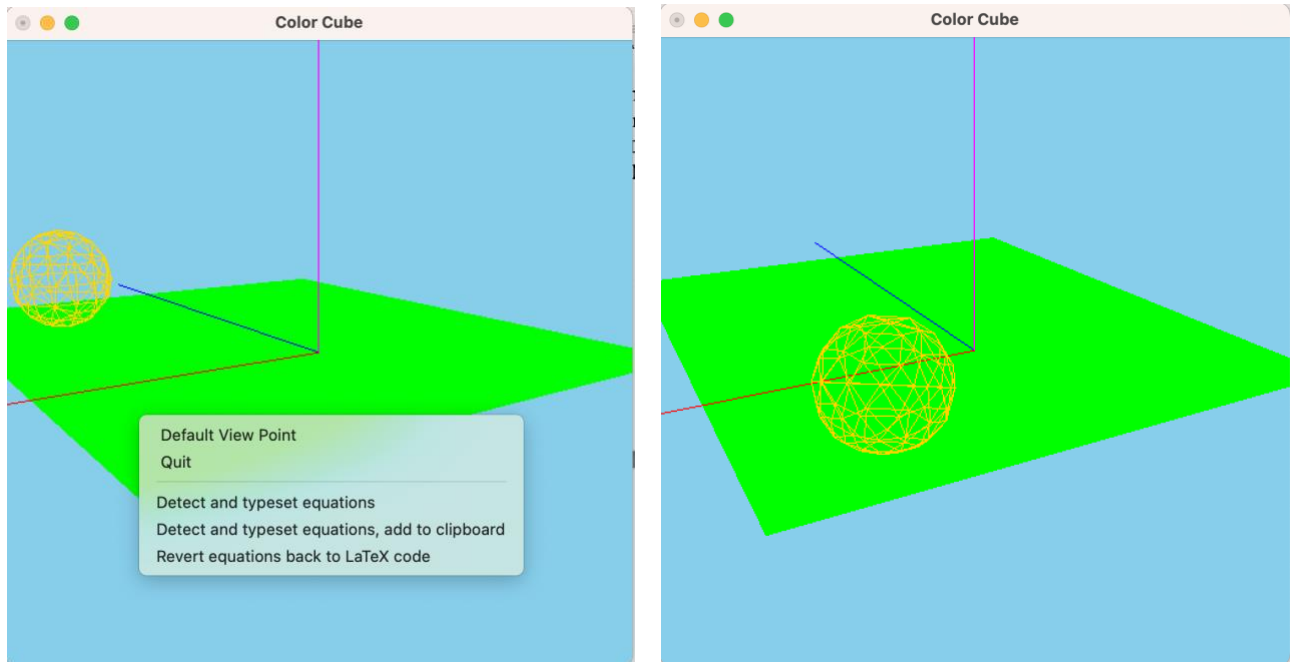
In Mac, the line " # include <GLUT/freeglut_ext.h>" cannot work which would cause errors. So I comment out this line in the file "Angel-yjc.h" and "glutSetMenuFont(menu_ID, GLUT_BITMAP_HELVETICA_18);" in the file "rotate-sphere.cpp".

Also, I am not sure if the rolling speed on Mac and Windows systems is the same with identical setting (angle increment). In my computer , "angle += 1.0f" works properly, but I'm not sure if "angle += 0.5f" or "angle += 0.3f" can work better in Windows.