

This is a take-home final. It is an individual project (no group submissions), but you are welcome to consult the class notes & demos, text book, Internet resources, and friends (subject to the usual rules about copying/plagiarism – you may share ideas, not code). Cite any Internet or friend resources you use!

Start with scene0.cpp. This will provide all with the same basic setup (and a floor), including the projection settings. Remove the cones that are only there to orient the scene, locate the origin and provide some scale. (See the code for specifics – you should be able to figure it out.)

Create four separate programs that demonstrate each of the following four tasks. (Note – They build upon one another so the first is important.)

I will provide a series of screenshots to which you can compare your work.

Program 1: constructive solid geometry

- Draw:
 - a dark gray platform twice as wide and deep as it is high
 - a light gray snow man atop the platform with scaled spheres (squashed in the y-dimension and expanded in the x-z plane)
- The entire stack of objects is shifted six units away along the z-axis.
- Use (constant) variables that allow you to adjust sizes easily.
- The camera settings and projection should remain the same throughout.

Program 2: light & animation

- Add a low amount of very slightly blue (global) ambient light
- Change the color of the light source to somewhat yellow
- Make the direction of the light to be at equal angles to all three axes (sun over your right shoulder)
- Add animation that rotates the camera in a circle (parallel to the x-z plane), always looking at the origin (or equivalently, rotate the entire scene)
- *You may have to adjust the constants you used in part1 to prevent the snowman from being clipped as the camera rotates.*

Program 3: texture & fog

- Find an appropriate snow texture and add it to the snowman (only)
 - Make sure the texture blends with the light
- Add fog - the effect should be clearly visible on the floor, but leave the other objects (relatively) clearly visible.
- *Like the sizes in part1, this is less specific then you probably wish, but you have a series of images to help guide your selections.*

Program 4: alpha & antialiasing

- Create four translucent walls of height 6 and width 10 that enclose the snowman
 - with colors red, blue, green and cyan (as shown)
- each will have the opacity set at 50%
- Choose the blending mode to most closely match the images provided.
- Antialias all of the polygons.