

# CSC 350 - Computer Graphics - Homework 3

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**Problem 1** *What feature in OpenGL is used to display the closest object when several objects overlap the same pixel? (0.5 points)*

The OpenGL feature that is used to display the closest object during overlapping is the Depth Buffer. The depth buffer contains per pixel data for the z depth of each pixel rendered.

**Problem 2** *What are the lower left front and upper right back corners of the view frustum defined by the statement `glFrustum(1.,2.,3.,4.,5.,6.);`, show your work (0.5 points)*

As defined by slides:

$$\begin{aligned} &= \text{glFrustum}(\text{left}, \text{right}, \text{bottom}, \text{top}, \text{near}, \text{far}); \\ \text{LowerLeftFront} &= (\text{left}, \text{bottom}, -\text{near}) \\ \text{UpperRightBack} &= ((\text{far}/\text{near}) * \text{right}, (\text{far}/\text{near}) * \text{top}, -\text{far}) \end{aligned}$$

Therefore, using the input from the question:

$$\begin{aligned} \text{LowerLeftFront} &= (1, 3, -5) \\ \text{UpperRightBack} &= ((6/5) * 2, (6/5) * 4, -6) \\ &= ((1.2) * 2, (1.2) * 4, -6) \\ &= (2.4, 4.8, -6) \end{aligned}$$

**Problem 3** *What are display lists and why are they useful? (0.5 points)*

A display list is a collection of OpenGL commands that are stored so they can be executed later. They are useful for performance, efficiency, and when running on a network.

**Problem 4** *Why is it a bad idea to draw in the mouse or keyboard callback function? (0.5 points)*

It is a bad idea as it is unpredictable, and not efficient due to how the mouse and keyboard callback functions operate.