CS 480/680 Computer Graphics

Spring 1999 - Dr. George Bebis

Programming Assignment 1

Due date: 2/23/99

Write an OpenGL program that allows interactive creation and manipulation of filled squares, rectangles and polygons. I will not give complete specifications for the program. It is up to you to design the details of the visual presentation and user interaction. However, the following functionality is required:

- Create, using the mouse, filled squares, rectangles and polygons. The typical way to do this is to select from a menu the type of item you wish to create, and then enter a "drawing" mode in which mouse clicks and motion are interpreted appropriately as defining the desired shape.

- Select a shape by clicking the mouse on it. As a side effect, this should "raise" that shape to the "front" of the window so that no other shapes obscure it.

- Delete the currently selected shape.

- Change the color of the currently selected shape.

Shape creation

You should think carefully about the interaction involved in shape creation. One way to create a rectangle is to drag out a region, interpreting the position of the "left mouse down" event as one corner of the rectangle, and the position of the subsequent "mouse up" event as the diagonally opposite corner.

For polygons, you do not know ahead of time how many vertices will be. A sequence of click and drag gestures can be used to define a polygon. Each "left mouse down" and subsequent "mouse up" event defines a new edge of the polygon, starting from the most recently created vertex.

In polygon creating mode, an additional requirement is that you must be able to "undo" the most recent vertex creation. For example, if you are in the middle of creating a polygon and have defined four points so far, you should be able, by a "middle button click" or other means, to remove the most recently created vertex, leaving you with three again (from which point you can add a new forth vertex and so on).

Shape overlap and visibility

You need to maintain a sorted list of shapes so that they can be drawn in the right order (i.e., recently selected shapes should be in front of others).