

Assignment 2: Polygon Drawing

This assignment is an extension of the paint program in Chapter 2. You may start with the code for the paint program or start from scratch (which I think is a better option).

You are to write an interactive program that will allow the user to both create and delete polygonal objects. There must be three interrelated parts to your program.

Object creation: The user should be able to use the mouse to indicate vertices. There must be a way to end a list of vertices and thus complete a polygon. For example, you might use the right mouse button to add vertices and the left button to terminate the list and connect the last vertex back to the first on the display.

Object deletion: There must be a way of deleting polygons. For example, you might use the middle mouse button to delete the polygon that the mouse is pointed at. You can use the one of the picking mechanisms described in the text. Which you use is related to how you choose to store objects.

Object storage: Unlike the paint program, this program must have some mechanism for storing the objects that the user creates. There are many ways to accomplish this task. You could create an object table of pointers to lists of vertices. Deletion of an object could be as simple as deleting a pointer in the table. Drawing all objects could be accomplished by going through the table drawing all objects with non null pointers. A better solution is to use a linked list. Adding and deleting objects would then require the standard algorithms for adding and deleting nodes in the lists. Each node could store the information for a single polygon or a pointer to data structure for a single polygon, perhaps another linked list.

Note that deletion requires some sort of picking mechanism. Because you can design your own data structure for storing polygons, you can put information into the data structure that will aid in picking.

The minimum assignment is to create a program that supports interactive drawing of two-dimensional polygons and deletion of existing polygons using the mouse. There is a lot of room for doing a really nice job. For example, you might

1. Support filling of polygons
2. Allow the user to choose the color of the polygon
3. Allow the user to move polygons
4. Allow the user to change the location of individual vertices
5. Support three dimensional polygons

Due: Tuesday, October 3.