

Use the program `Lecture 4 Demo 1.cpp` in the following problems.

1. Does Microsoft Windows allow the user to change the size of a window by dragging the left edge?
2. Does Microsoft Windows allow the user to change the size of a window by dragging the top edge?
3. Does the `reshape()` function have a way of knowing which edge was dragged?
4. Let the viewport dimensions be `screenWidth` \times `screenHeight` and let the world coordinates be from `(xmin, ymin)` in the lower left corner to `(xmax, ymax)` in the upper right corner. Suppose the user changes the viewport dimensions to `w` \times `h`. If we want to keep the *lower right* corner of the scene fixed, which of the four values `xmin`, `xmax`, `ymin`, `ymax` will need to be updated?
5. Continuing the previous problem, find a formula for the new value of `xmin`.
6. Continuing the previous problem, find a formula for the new value of `ymax`.
7. Implement your formulas from the previous two exercises in the `reshape()` function so that it will leave the lower right corner fixed.
8. Some programs adjust the size of the image in proportion with the width of the viewport, thereby always showing the same content horizontally (e.g., the full width of a page). However, if the aspect ratio changes, then more or less of the scene will be shown vertically. Under this scheme, with the upper left corner fixed, which of the four values `xmin`, `xmax`, `ymin`, `ymax` will need to be updated when the window is resized?
9. Continuing the previous problem, let r be the ratio between the original viewport width `screenWidth` and the new width `w`. Find a formula for the new value of `ymin`.
10. Implement your formulas from the previous exercise in the `reshape()` function.