

LAB EXERCISE – 5

Objectives:

To implement the line clipping algorithms against rectangular clipping regions

Problem Statements:

A clipping window has been specified by its lower left hand corner $(-3, 1)$ and upper right-hand corner at $(2, 6)$. An arbitrary line-segment is drawn between the two points obtained through random mouse clicks. A subsequent right mouse click clips the line against the specified clipping window.

Also, display/print the line endpoints and intersection points. Assume suitable size of the GLUT window. Apply the **Cohen-Sutherland** / **Liang-Barsky** algorithm to clip the above line segment.

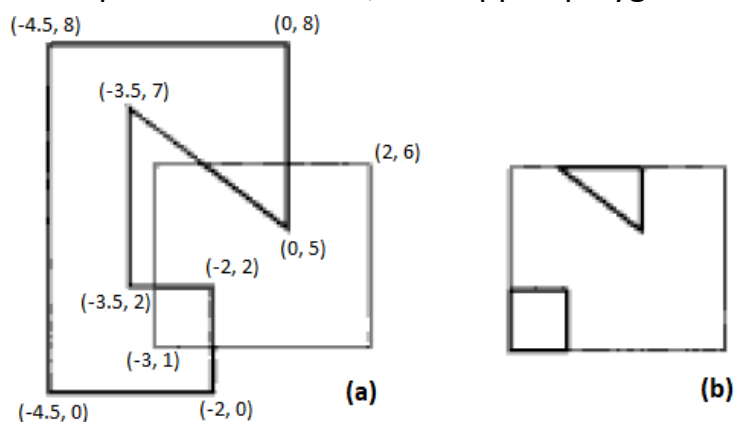
LAB EXERCISE – 6

Objectives:

To implement the polygon clipping algorithms against rectangular clipping regions

Problem Statements:

Apply the Sutherland-Hodgman on the polygon given in Fig. (a) to generate the clipped polygon shown in Fig. (b). The lower-left corner of the clipping window is $(-3, 1)$ and upper right-hand corner is $(2, 6)$. Initially, whole polygon should be visible. Upon a mouse click, the clipped polygon should appear.



LAB EXERCISE – 7

Objectives:

To implement 2D transformations

Problem Statements:

Take a polygon by accepting its vertices in order (Through Keyboard). Perform scaling and rotation operations over this polygon. Show the original and transformed polygons on the display.

LAB EXERCISE – 8

Objectives:

To implement 2D transformations with GUI interaction

Problem Statements:

(1) Take a polygon by accepting its vertices in order through random mouse clicks. Perform scaling and rotation operations over this polygon through key/mouse window events. On each keypress/mouse click, the further transformation effect should be evident over the existing figure.

(2) Write a menu-driven program to implement various 2D transformations such as:

- Translation
- Rotation
- Scaling
- Reflection
- Shear

When an option pertaining to a transformation is selected, the system should ask for relevant parameters. Use keyboard events for interaction with the menu. (Bonus marks)

LAB EXERCISE – 9

Objectives:

To implement 3D transformations using OpenGL

Problem Statements:

Write a program to perform the scale and rotation operations over a 3D primitive (e.g., cube). Vertices of the cube can be presumed. Both the figures, before and after the transformations should be displayed.