

Assignment 5

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Performance Date:

Submission Date:

Problem Statement:

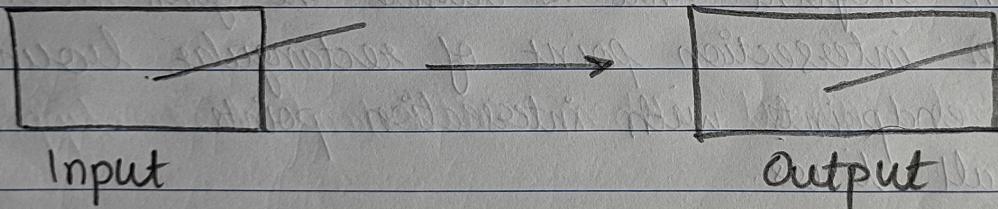
Write C++ program to implement Cohen Sutherland algorithm.

Prerequisites:

1. Basic programming of C++.
2. 64 bit OS.

Theory:

Cohen Sutherland algorithm is a line clipping algorithm that cuts line to portion which are within a rectangular area. It eliminates the lines from a given set of lines & rectangular area of interest (view port).



The algorithm divides 2 dimensional space into 9 regions (8 out 1 in), then efficiently determines the lines & portions of lines that are visible in the central region of interest.

TBRL - TOP BOTTOM LEFT RIGHT

1001	1000	1010
0001	0000	0010
0101	0100	0110

Calculation of region code (4 bit)

1. Set the first bit if point lies left to window ($x < x_{\min}$)
2. Set second bit if pt. lies right to window ($x > x_{\max}$)
3. Set 3rd bit if pt. lies to the bottom ($y < y_{\min}$)
4. Set 4th bit if pt. lies to the top ($y > y_{\max}$)

Algorithm

1. Start
2. Assign a region code for 2 ends of given line.
3. If both endpoints are 0000 then line is inside & we keep it.
4. If step III fails, perform logical AND operation for both region code.
5. If result is not 0000 line is completely outside.
6. Else it is partially inside.
 - Choose an endpoint that is outside the given rectangle.
 - Find the intersection point of rectangular boundary.
7. Replace endpoints with intersection points.
8. Repeat all lines.
9. Stop.

Test Cases:

Input

Exp O/P

Actual O/P

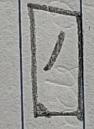
Result.



Pass



Pass



Pass



Pass



Pass

Conclusion:

We learned about Cohen Sutherland line clipping algorithm at 11.12.23