

**Department of Computer Science &Engineering(CSE)**

**LAB - 9**

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Course Code : CSE-4742

Course Title : Computer Graphics Lab

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**Cohen-Sutherland algorithm for line clipping :**

#include <bits/stdc++.h>

#include <conio.h>

#include <graphics.h>

using namespace std;

#define LEFT 1

#define RIGHT 2

#define BOTTOM 4

#define TOP 8

int xmin, ymin, xmax, ymax;

int draw(int x, int y)

{

int code = 0;

if (x < xmin)

{

code |= LEFT;

}

else if (x > xmax)

{

code |= RIGHT;

}

if (y < ymin)

{

code |= BOTTOM;

}

else if (y > ymax)

{

code |= TOP;

}

return code;

}

void cohenSutherland\_algo(int x0, int y0, int x1, int y1)

{

int code0 = draw(x0, y0);

int code1 = draw(x1, y1);

int accept = 0;

while (1)

{

if ((code0 | code1)==0)

{

accept = 1;

break;

}

else if (code0 & code1)

{

break;

}

else

{

int codeOut;

int x, y;

if (code0)

{

codeOut = code0;

}

else

{

codeOut = code1;

}

if (codeOut & TOP)

{

x = x0 + (x1 - x0) \* (ymax - y0) / (y1 - y0);

y = ymax;

}

else if (codeOut & BOTTOM)

{

x = x0 + (x1 - x0) \* (ymin - y0) / (y1 - y0);

y = ymin;

}

else if (codeOut & RIGHT)

{

y = y0 + (y1 - y0) \* (xmax - x0) / (x1 - x0);

x = xmax;

}

else

{

y = y0 + (y1 - y0) \* (xmin - x0) / (x1 - x0);

x = xmin;

}

if (codeOut == code0)

{

setcolor(BLACK);

line(x0, y0, x, y);

putpixel(x,y,WHITE);

x0 = x;

y0 = y;

code0 = draw(x0, y0);

}

else

{

setcolor(BLACK);

line(x1, y1, x, y);

putpixel(x,y,WHITE);

x1 = x;

y1 = y;

code1 = draw(x1, y1);

}

}

}

}

int main()

{

int gd = DETECT, gm;

initgraph(&gd, &gm, "");

cout << "Enter the size of window : ";

cin >> xmin >> ymin >> xmax>>ymax;

rectangle(xmin, ymin, xmax, ymax);

int x1,y1,x2,y2;

cout << "Enter the size of line : ";

cin >> x1>>y1>>x2>>y2;

line(x1, y1, x2, y2);

int n;

cin>>n;

cohenSutherland\_algo(x1, y1, x2, y2);

getch();

closegraph();

return 0;

}