UCS1712 – GRAPHICS AND MULTIMEDIA LAB

Ex. No. 3 Bresenham’s Line Drawing Algorithm in C++ using OpenGL

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Question:

To plot points that make up the line with endpoints (x0,y0) and (xn,yn) using Bresenham’s line drawing algorithm.

Case 1: +ve slope Left to Right line

Case 2: +ve slope Right to Left line

Case 3: -ve slope Left to Right line

Case 4: -ve slope Right to Left line

Each case has two subdivisions (i) |m|<= 1 (ii) |m|>1

Note that all four cases of line drawing must be given as test cases.

Code:

```
#include<GL/glut.h>
#include<stdio.h>
#include<iostream>

using namespace std;

float x1_arr[8], y1_arr[8], x2_arr[8], y2_arr[8];

void myInit()
{
glClearColor(0.0,0.0,0.0,1.0);
gluOrtho2D(-20,100,-20,100);
}

void myDisplay()
{
glClear(GL_COLOR_BUFFER_BIT);
float dy,dx,step,x,y,k,Xin,Yin,p;
float x1, y1, x2, y2;

for (int i = 0; i < 3; i++) {

x1 = x1_arr[i];
y1 = y1_arr[i];
x2 = x2_arr[i];
y2 = y2_arr[i];

dx=x2-x1;
dy=y2-y1;

    p=2dy-dx;

x= x1;
y=y1;

    while(x<=x2 && y <= y2)
    {
      if(p>=0)
      {
        glColor3f(1.0,1.0,1.0);
        glBegin(GL_POINTS);
          glVertex2i(x,y);
        glEnd();

        y=y+1;
        p=p+2dy-2dx;
      }
      else
      {
        glColor3f(1.0,1.0,1.0);
        glBegin(GL_POINTS);
          glVertex2i(x,y);
        glEnd();

        p=p+2dy;
        x=x+1;
      }

    }

    glColor3f(1.0,1.0,1.0);
    glBegin(GL_POINTS);
      glVertex2i(x,y);
    glEnd();

}

glFlush();

}

int main(int argc,char* argv[])
{
```

```
x1_arr[0] = 10;
y1_arr[0] = 10;
x2_arr[0] = 80;
y2_arr[0] = 10;

x1_arr[1] = 10;
y1_arr[1] = 70;
x2_arr[1] = 80;
y2_arr[1] = 70;

    x1_arr[2] = 45;
y1_arr[2] = 10;
x2_arr[2] = 45;
y2_arr[2] = 70;

glutInit(&argc,argv);
glutInitDisplayMode(GLUT_SINGLE|GLUT_RGB);
glutInitWindowSize (500, 500);
glutInitWindowPosition (100,100);
glutCreateWindow("check");
glutDisplayFunc(myDisplay);
myInit();
glutMainLoop();
return 1;
}
```

Output: