UCS 1712 – GRAPHICS AND MULTIMEDIA LAB

ASSIGNMENT – 3

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CSEC

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1. BRESENHAM'S LINE DRAWING ALGORITHM:

```
#include <GL/glut.h>
#include <stdio.h>
#include <iostream>
using namespace std;

int x_1, y_1, x_2, y_2;

void myInit() {
    glClearColor(1.0, 1.0, 1.0, 0.0);
    glColor3f(0.0f, 0.0f, 0.0f);
    glPointSize(0.05);
    glMatrixMode(GL_PROJECTION);
    glLoadIdentity();
    gluOrtho2D(-600.0, 600.0, -600.0, 600.0);
}

void draw_pixel(int x, int y) {
    glBegin(GL_POINTS);
    glVertex2i(x, y);
    glEnd();
}

void myBresenham(int x_1, int x_2, int y_1, int y_2) {
    int dx, dy, i, e;
    int incx, incy, inc1, inc2;
    int x,y;

    dx = x_2 - x_1;
    dy = y_2 - y_1;

    if (dx < 0) dx = -dx;
    if (dy < 0) dy = -dy;
    incx = 1;
    if (x_2 < x_1) incx = -1;
    incy = 1;
    if (y_2 < y_1) incy = -1;
```

```
    x = x_1; y = y_1;
    if (dx > dy) {
        draw_pixel(x, y);
        e = 2 * dy-dx;
        inc1 = 2*(dy-dx);
        inc2 = 2*dy;
        for (i=0; i<dx; i++) {
            if (e >= 0) {
                y += incy;
                e += inc1;
            }
            else
                e += inc2;
            x += incx;
            draw_pixel(x, y);
        }

    } else {
        draw_pixel(x, y);
        e = 2*dx-dy;
        inc1 = 2*(dx-dy);
        inc2 = 2*dx;
        for (i=0; i<dy; i++) {
            if (e >= 0) {
                x += incx;
                e += inc1;
            }
            else
                e += inc2;
            y += incy;
            draw_pixel(x, y);
        }
    }
}

void myDisplay() {
    glClear(GL_COLOR_BUFFER_BIT);
    glBegin(GL_LINES);
    glVertex2d(-600, 0);
    glVertex2d(600, 0);
    glEnd();
    glBegin(GL_LINES);
    glVertex2d(0, -600);
    glVertex2d(0, 600);
    glEnd();
    myBresenham(x_1, x_2, y_1, y_2);
    glFlush();
}
```

```
int main(int argc, char **argv) {
    cout << "Enter (x_1, y_1, x_2, y_2)" << endl;
    cin >> x_1 >> y_1 >> x_2 >> y_2;

    glutInit(&argc, argv);
    glutInitDisplayMode(GLUT_SINGLE|GLUT_RGB);
    glutInitWindowSize(600, 600);
    glutInitWindowPosition(0, 0);
    glutCreateWindow("Bresenham");
    myInit();
    glutDisplayFunc(myDisplay);
    glutMainLoop();
    return 0;
}
```

OUTPUT: