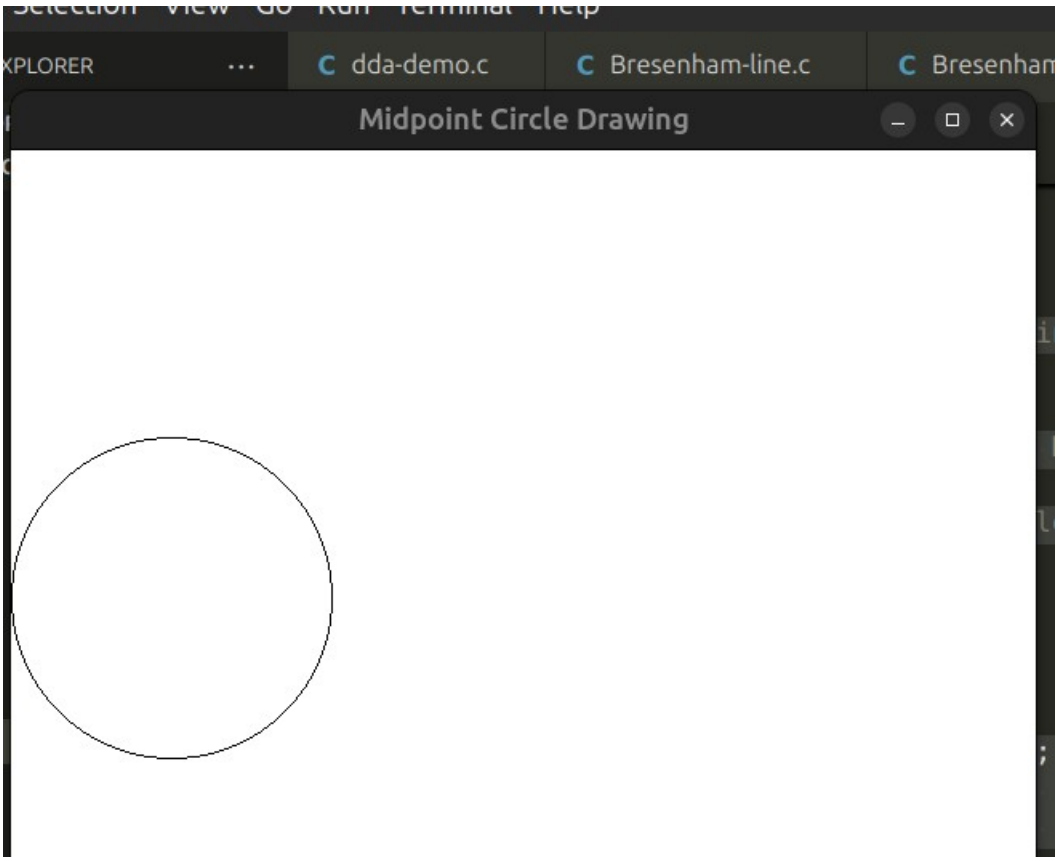
Name:Harshada Gopal Rayate
Roll No:19 SEDA
Subject :CGAVR

Mid-point Circle Algorithm

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

int centerX, centerY, radius;

// Function to plot points in all octants
void plotCirclePoints(int x, int y) {
glBegin(GL_POINTS);
glVertex2i(centerX + x, centerY + y);
glVertex2i(centerX - x, centerY + y);
glVertex2i(centerX + x, centerY - y);
glVertex2i(centerX - x, centerY - y);
glVertex2i(centerX + y, centerY + x);
glVertex2i(centerX - y, centerY + x);
glVertex2i(centerX + y, centerY - x);
glVertex2i(centerX - y, centerY - x);
glEnd();
}

// Midpoint Circle Drawing Algorithm
void drawCircle() {
int x = 0;
int y = radius;
int p = 1 - radius; // Initial decision parameter

plotCirclePoints(x, y); // Plot initial point

while (x < y) {
x++;
if (p < 0) {
p += 2 * x + 1; // Midpoint is inside the circle
} else {
y--;
p += 2 * (x - y) + 1; // Midpoint is outside the circle
}
plotCirclePoints(x, y); // Plot points in all octants
}
}

// Initialization function
```

```
void init() {
glClearColor(1.0, 1.0, 1.0, 0.0); // Set background color to white
glColor3f(0.0f, 0.0f, 0.0f); // Set point color to black
glPointSize(1.0); // Set point size
glMatrixMode(GL_PROJECTION);
gluOrtho2D(0.0, 640.0, 0.0, 480.0); // Set the coordinate system
}

// Display callback function
void display() {
glClear(GL_COLOR_BUFFER_BIT); // Clear the color buffer
drawCircle(); // Draw the circle
glFlush(); // Render now
}

int main(int argc, char** argv) {
printf("Enter the coordinates of the center:\n");
printf("X-coordinate: ");
scanf("%d", &centerX);
printf("Y-coordinate: ");
scanf("%d", &centerY);
printf("Enter radius: ");
scanf("%d", &radius);

glutInit(&argc, argv); // Initialize GLUT
glutInitDisplayMode(GLUT_SINGLE | GLUT_RGB); // Set display mode
glutInitWindowSize(640, 480); // Set window size
glutInitWindowPosition(100, 150); // Set window position
glutCreateWindow("Midpoint Circle Drawing"); // Create window with title

init(); // Call initialization function
glutDisplayFunc(display); // Register display function

glutMainLoop(); // Enter the GLUT event loop
return 0;
}
```


XPLORER
dda-demo.c
Bresenham-line.c
Midpoint Circle Drawing