CSE 423

Lab Assignment 3

Name: S.M. ABRAR MUSTAKIM TAKI

ID: 20301125

SEC: 05

Home Task

CODE:

```
from OpenGL.GL import *
from OpenGL.GLUT import *
from OpenGL.GLU import *
import math

#Midpoint Line Drawing Algorithms
def midpointcircle(x, y, r):
    glPointSize(2) #pixel size. by default 1 thake
    glBegin(GL_POINTS)
    #N, S, E, W from center
    d = 1.25-r
    x1 = x
    y1 = y
    x = 0
    y = r
    if x1 != 0 or y1!=0:
        glVertex2f(x+x1, y+y1)
        glVertex2f(y+y1, x+x1)
        glVertex2f(y+y1, -x+x1)
        glVertex2f(x+x1, -y+y1)
        glVertex2f(-x+x1, -y+y1)
        glVertex2f(-y+y1, -x+x1)
        glVertex2f(-y+y1, x+x1)
        glVertex2f(-x+x1, y+y1)
```

```
else:
        glVertex2f(x, y)
        glVertex2f(y, x)
        glVertex2f(y, -x)
        glVertex2f(x, -y)
        glVertex2f(-x, -y)
        glVertex2f(-y, -x)
        glVertex2f(-y, x)
        glVertex2f(-x, y)
while x <= y:
        if d<0:
                #E
                d = d+2*x+3
                x += 1
        else:
                d = d + 2*x - 2*y + 5
                x = x + 1
                y = y - 1
        if x1 != 0 or y1!=0:
                glVertex2f(x+x1, y+y1)
                glVertex2f(y+y1, x+x1)
                glVertex2f(y+y1, -x+x1)
                glVertex2f(x+x1, -y+y1)
                glVertex2f(-x+x1, -y+y1)
                glVertex2f(-y+y1, -x+x1)
                glVertex2f(-y+y1, x+x1)
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```
            else:
                glVertex2f(x, y)
                glVertex2f(y, x)
                glVertex2f(y, -x)
                glVertex2f(x, -y)
                glVertex2f(-x, -y)
                glVertex2f(-y, -x)
                glVertex2f(-y, x)
                glVertex2f(-x, y)
        glEnd()



def iterate():
        glViewport(0, 0, 500, 500)
        glMatrixMode(GL_PROJECTION)
        glLoadIdentity()
        glOrtho(0.0, 500, 0.0, 500, 0.0, 1.0)
        glMatrixMode (GL_MODELVIEW)
        glLoadIdentity()

def showScreen():
        glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT)
        glLoadIdentity()
        iterate()
        glColor3f(0.5, 0.5, 1.0) #konokichur color set (RGB)
        x, y, r = 250, 250, 200
```

```
        midpointcircle(x, y, r)
        r1 = r//2
        #N, S, E, W axis Circle
        midpointcircle(x+r1, y, r1)
        midpointcircle(x-r1, y, r1)
        midpointcircle(x, y+r1, r1)
        midpointcircle(x, y-r1, r1)
        #Corners Circle
        rs = math.sqrt((r1**2)/2)
        midpointcircle(x+rs, y+rs, r1)
        midpointcircle(x-rs, y-rs, r1)
        midpointcircle(x-rs, y+rs, r1)
        midpointcircle(x+rs, y-rs, r1)
        glutSwapBuffers()

glutInit()
glutInitDisplayMode(GLUT_RGBA)
glutInitWindowSize(500, 500) #window size
glutInitWindowPosition(0, 0)
wind = glutCreateWindow(f"20301125: Midpoint Circle") #window name
glutDisplayFunc(showScreen)
glutMainLoop()
```

ScreenShot