­­­­­­import random  
  
from OpenGL.GL import \*  
from OpenGL.GLUT import \*  
from OpenGL.GLU import \*  
  
  
def points(x, y):  
 glPointSize(2)  
 glBegin(GL\_POINTS)  
 glVertex2f(x, y)  
 glEnd()  
  
  
def draw\_point(x, y, center\_x, center\_y, x\_values\_array, y\_values\_array):  
 x\_values\_array = x\_values\_array + [x + center\_x, y + center\_x, y + center\_x, x + center\_x, -x + center\_x, -y + center\_x, -y + center\_x, -x + center\_x]  
 y\_values\_array = y\_values\_array + [y + center\_y, x + center\_y, -x + center\_y, -y + center\_y, -y + center\_y, -x + center\_y , x + center\_y, y + center\_y]  
 for (j, k) in zip(x\_values\_array, y\_values\_array):  
 points(j, k)  
  
  
def mid\_Point\_Circle(radius, center\_x, center\_y, x\_values\_array, y\_values\_array):  
 x = 0  
 y = radius  
 d = 1 - radius  
 draw\_point(x, y, center\_x, center\_y, x\_values\_array, y\_values\_array)  
 while x < y:  
 if d > 0:  
 d += 2 \* x - 2 \* y + 5  
 x += 1  
 y -= 1  
 else:  
 d += 2 \* x + 3  
 x += 1  
 draw\_point(x, y, center\_x, center\_y, x\_values\_array, y\_values\_array)  
  
  
value\_x\_array = []  
value\_y\_array = []  
  
  
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 display\_screen():  
 glClear(GL\_COLOR\_BUFFER\_BIT | GL\_DEPTH\_BUFFER\_BIT)  
 glLoadIdentity()  
 iterate()  
 glColor3f(1.0, 0.0, 0.0)  
  
 # call the draw methods here  
 # mid\_Point\_Circle(radius, center\_x, center\_y, value\_x\_array, value\_y\_array)  
  
 mid\_Point\_Circle(150, 150+130, 150+130, value\_x\_array, value\_y\_array) # outer circle  
 mid\_Point\_Circle(75, 150+130, 225+130, value\_x\_array, value\_y\_array) # up circle  
 mid\_Point\_Circle(75, 207+130, 197+130, value\_x\_array, value\_y\_array) # up and right er majhkhane  
 mid\_Point\_Circle(75, 225+130, 150+130, value\_x\_array, value\_y\_array) # right circle  
 mid\_Point\_Circle(75, 206+130, 100+130, value\_x\_array, value\_y\_array) # right ar down er majhkhane  
 mid\_Point\_Circle(75, 150+130, 75+130, value\_x\_array, value\_y\_array) # down circle  
 mid\_Point\_Circle(75, 94+130, 100+130, value\_x\_array, value\_y\_array) # down ar left er majhkhane  
 mid\_Point\_Circle(75, 75+130, 150+130, value\_x\_array, value\_y\_array) # left circle  
 mid\_Point\_Circle(75, 95+130, 200+130, value\_x\_array, value\_y\_array) # left ar up er majhkhane  
  
  
  
  
  
 glutSwapBuffers()  
  
  
glutInit()  
glutInitDisplayMode(GLUT\_RGBA)  
glutInitWindowSize(600, 600)  
glutInitWindowPosition(0, 0)  
wind = glutCreateWindow(b"Lab Assignment 03")  
glutDisplayFunc(display\_screen)  
  
glutMainLoop()

