**CSE423 LAB FINAL**

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Section:3

**from OpenGL.GL import \***

**from OpenGL.GLUT import \***

**from OpenGL.GLU import \***

**def draw\_point(x,y):**

**glPointSize(4) #pixel size**

**glEnable(GL\_POINT\_SMOOTH)**

**glBegin(GL\_POINTS)**

**glVertex2f(x,y)**

**glEnd()**

**def midpointcircle(xc,yc,r):**

**d = 1-r**

**x = 0**

**y = r**

**circlep(x, y, xc, yc)**

**while (x<y):**

**if d<0:**

**d = d+2\*x+3**

**x = x+1**

**#choose E**

**else:**

**d = d+2\*x-2\*y+5**

**x = x+1**

**y = y-1**

**circlep(x, y, xc, yc)**

**def circlep(x, y, xc, yc):**

**zonechange(x, y, xc, yc)**

**def zonechange(x, y, xc, yc):**

**new\_x = x + xc**

**new\_y = y + yc**

**draw\_point(new\_x, new\_y)**

**new\_x = y + xc**

**new\_y = x + yc**

**draw\_point(new\_x, new\_y)**

**new\_x = -1 \* y + xc**

**new\_y = x + yc**

**draw\_point(new\_x, new\_y)**

**new\_x = -1 \*x + xc**

**new\_y = y + yc**

**draw\_point(new\_x, new\_y)**

**new\_x = -1 \* x + xc**

**new\_y = -1 \* y + yc**

**draw\_point(new\_x, new\_y)**

**new\_x = -1 \* y + xc**

**new\_y = -1 \* x + yc**

**draw\_point(new\_x, new\_y)**

**new\_x = y + xc**

**new\_y = -1 \* x + yc**

**draw\_point(new\_x, new\_y)**

**new\_x = x+ xc**

**new\_y = -1 \* y + yc**

**draw\_point(new\_x, new\_y)**

**def find\_zones(dx, dy):**

**if abs(dx) > abs(dy):**

**if dx>0 and dy>=0:**

**return 0**

**elif dx<=0 and dy>=0:**

**return 3**

**elif dx>=0 and dy>=0:**

**return 7**

**elif dx<=0 and dy<=0:**

**return 4**

**else:**

**if dx>=0 and dy>=0:**

**return 1**

**elif dx <= 0 and dy >= 0:**

**return 2**

**elif dx<=0 and dy<=0:**

**return 5**

**elif dx>=0 and dy<=0:**

**return 6**

**def convert\_to\_zone0(x1, y1, x2, y2, zone):**

**if zone == 0:**

**return x1, y1, x2, y2**

**elif zone == 1:**

**return y1, x1, y2, x2**

**elif zone == 2:**

**return y1, -x1, y2, -x2**

**elif zone == 3:**

**return -x1, y1, -x2, y2**

**elif zone == 4:**

**return -x1, -y1, -x2, -y2**

**elif zone == 5:**

**return -y1, -x1, -y2, -x2**

**elif zone == 6:**

**return -y1, x1, -y2, x2**

**elif zone == 7:**

**return x1, -y1, x2, -y2**

**return x1,y1,x2,y2**

**def convert\_original\_zone(x, y, zone):**

**if zone == 0:**

**return x, y**

**if zone == 1:**

**return y, x**

**if zone == 2:**

**return -y, x**

**if zone == 3:**

**return -x, y**

**if zone == 4:**

**return -x, -y**

**if zone == 5:**

**return -y, -x**

**if zone == 6:**

**return y, -x**

**if zone == 7:**

**return x, -y**

**def mid\_point\_count(x1, y1, x2, y2):**

**dx = x2 - x1**

**dy = y2 - y1**

**zone\_no = find\_zones(dx, dy)**

**x1, y1, x2, y2 = convert\_to\_zone0(x1, y1, x2, y2, zone\_no)**

**d0 = 2 \* dy - dx**

**dNE = 2 \* (dy - dx)**

**dE = 2 \* dy**

**x = x1**

**y = y1**

**while x < x2:**

**p = x**

**q = y**

**p, q = convert\_original\_zone(x, y, zone\_no)**

**draw\_point(p, q)**

**x = x + 1**

**if (d0 < 0):**

**d0 = d0 + dE**

**else:**

**d0 = d0 + dNE**

**y = y + 1**

**def drawscenery():**

**#river**

**glColor3f(55.0 / 255.0,62.0 / 255.0, 5.0 / 255.0)**

**mid\_point\_count(10, 150, 1000, 350)**

**mid\_point\_count(8, 140, 998, 340)**

**#tree:**

**glColor3f(30.0 / 255.0, 100.0 / 255.0, 25.0 / 255.0)**

**midpointcircle(75, 170, 20)**

**midpointcircle(115, 150, 25)**

**midpointcircle(50, 140, 25)**

**midpointcircle(110, 200, 25)**

**midpointcircle(60, 220, 30)**

**midpointcircle(40, 180, 20)**

**#tree**

**glColor3f(95.0 / 255.0, 84.0 / 255.0, 64.0 / 255.0)**

**mid\_point\_count(70, 150, 70, 50)**

**mid\_point\_count(85, 150, 85, 50)**

**#office1**

**glColor3f(113.0 / 255.0, 129.0 / 255.0, 133.0 / 255.0)**

**mid\_point\_count(180, 320, 280, 320) #top**

**mid\_point\_count(180, 320, 180, 50)#left**

**mid\_point\_count(180, 250, 280, 250)#middle**

**mid\_point\_count(280, 320, 280, 50)#right**

**mid\_point\_count(180, 150, 280, 150)#middle1**

**mid\_point\_count(180, 50, 280, 50)#bottom**

**#tree**

**glColor3f(95.0 / 255.0, 84.0 / 255.0, 64.0 / 255.0)**

**mid\_point\_count(350, 150, 350, 50)**

**mid\_point\_count(365, 150, 365, 50)**

**glColor3f(35.0 / 255.0, 120.0 / 255.0, 35.0 / 255.0)**

**midpointcircle(360, 180, 26)**

**# midpointcircle(360, 220, 20)**

**midpointcircle(360, 260, 20)**

**midpointcircle(380, 200, 25)**

**midpointcircle(340, 200, 25)**

**midpointcircle(345, 230, 20)**

**midpointcircle(375, 230,20)**

**#bridge**

**glColor3f(53.0 / 255.0, 35.0 / 255.0, 126.0 / 255.0)**

**mid\_point\_count(10, 350, 1200, 350)**

**mid\_point\_count(10, 370, 1200, 370)**

**glColor3f(139.0 / 255.0, 126.0 / 255.0, 210.0 / 255.0)**

**mid\_point\_count(500, 350, 600, 450)**

**mid\_point\_count(550, 370, 650, 470)#**

**mid\_point\_count(700, 350, 600, 450)**

**mid\_point\_count(750,370, 650, 470)#**

**mid\_point\_count(300, 350, 400, 450)**

**mid\_point\_count(350,370, 450, 470)**

**mid\_point\_count(500, 350, 400, 450)**

**mid\_point\_count(550, 370, 450, 470)**

**mid\_point\_count(300, 350, 200, 450)**

**mid\_point\_count(350, 370, 250, 470)**

**mid\_point\_count(100, 350, 200, 450)**

**mid\_point\_count(150, 370, 250, 470)**

**mid\_point\_count(100, 450, 100, 350)**

**mid\_point\_count(150, 470, 150, 370)**

**mid\_point\_count(80, 450, 80, 350)**

**mid\_point\_count(130, 470, 130, 370)**

**#**

**mid\_point\_count(60, 450, 60, 350)**

**mid\_point\_count(110, 470, 110, 370)**

**mid\_point\_count(100, 450, 150, 470)#openingroof**

**mid\_point\_count(80, 450, 130, 470)**

**mid\_point\_count(60, 450, 110, 470)**

**#cloud**

**glColor3f(62.0 / 255.0, 173.0 / 255.0, 229.0 / 255.0)**

**midpointcircle(300, 550, 20)**

**midpointcircle(320, 520, 20)**

**midpointcircle(280, 520, 20)**

**glColor3f(60.0 / 255.0, 170.0 / 255.0, 225.0 / 255.0)**

**midpointcircle(600, 550, 20)**

**midpointcircle(620, 520, 20)**

**midpointcircle(580, 520, 20)**

**#lightening**

**glColor3f(221.0 / 255.0, 241.0 / 255.0, 70.0 / 255.0)**

**mid\_point\_count(580, 490, 610, 510)**

**mid\_point\_count(580, 490, 610, 495)**

**mid\_point\_count(580, 470, 610, 495)**

**#water**

**glColor3f(28.0 / 255.0, 197.0 / 255.0, 251.0 / 255.0)**

**mid\_point\_count(50, 300, 80, 300)**

**mid\_point\_count(70, 320, 100, 320)**

**mid\_point\_count(100, 250, 130, 250)**

**mid\_point\_count(110, 290, 140, 290)**

**mid\_point\_count(120, 270, 150, 270)**

**mid\_point\_count(300, 270, 330, 270)**

**mid\_point\_count(350, 300, 380, 300)**

**mid\_point\_count(400, 290, 430, 290)**

**mid\_point\_count(450, 320, 480, 320)**

**mid\_point\_count(420, 250, 450, 250)**

**mid\_point\_count(520, 270, 550, 270)**

**mid\_point\_count(620, 310, 650, 310)**

**mid\_point\_count(600, 320, 630, 320)**

**def iterate():**

**glViewport(0, 0, 800, 800)**

**glMatrixMode(GL\_PROJECTION)**

**glLoadIdentity()**

**glOrtho(0.0, 800, 0.0, 800, 0.0, 1.0)**

**glMatrixMode (GL\_MODELVIEW)**

**glLoadIdentity()**

**def showScreen():**

**glClear(GL\_COLOR\_BUFFER\_BIT | GL\_DEPTH\_BUFFER\_BIT)**

**glLoadIdentity()**

**#glFlush()**

**iterate()**

**# glColor3f(178.0, 242.0, 136.0) #konokichur color set (RGB)**

**#call the draw methods here**

**drawscenery()**

**glutSwapBuffers()**

**glutInit()**

**glutInitDisplayMode(GLUT\_RGBA)**

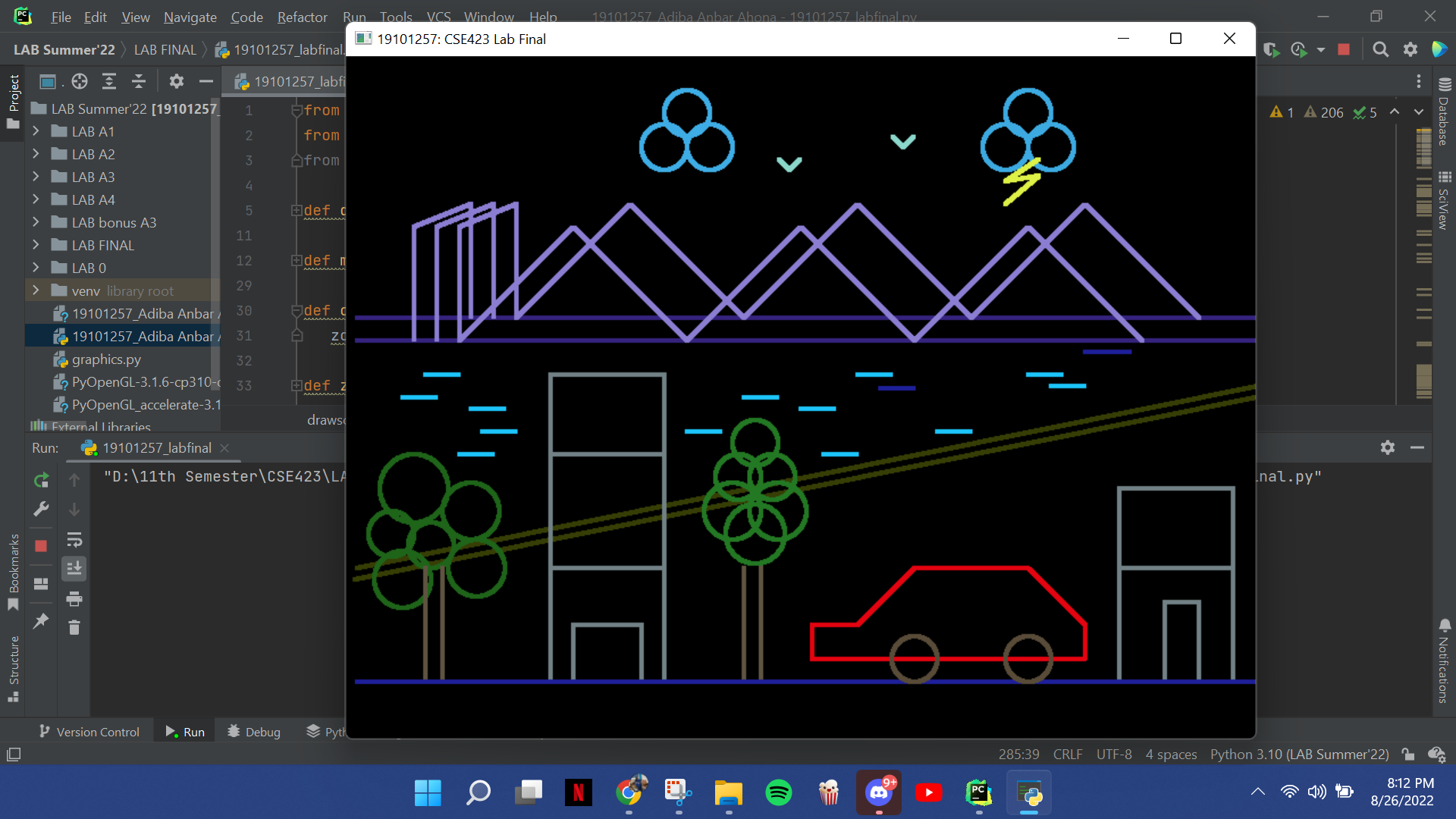
**glutInitWindowSize(800, 600) #window size**

**glutInitWindowPosition(0, 0)**

**wind = glutCreateWindow(b"CSE423 Lab Final") #window name**

**glutDisplayFunc(showScreen)**

**glutMainLoop()**

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