

## Task 1

### Code

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

def draw_points(x, y):
    glPointSize(5) #pixel size. by default 1 thake
    glBegin(GL_POINTS)
    glVertex2f(x,y) #jekhane show korbe pixel
    glEnd()

def draw_fifty_points():
    for i in range(50):
        x_coord = random.randint(0, 501)
        y_coord = random.randint(0, 501)
        draw_points(x_coord, y_coord)

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(0.4, 0.9, 0.6) #konokichur color set (RGB)
    #call the draw methods here
    draw_fifty_points()
    # draw_points(100, 100)
```

```
glutSwapBuffers()
```

```
glutInit()
```

```
glutInitDisplayMode(GLUT_RGBA)
```

```
glutInitWindowSize(500, 500) #window size
```

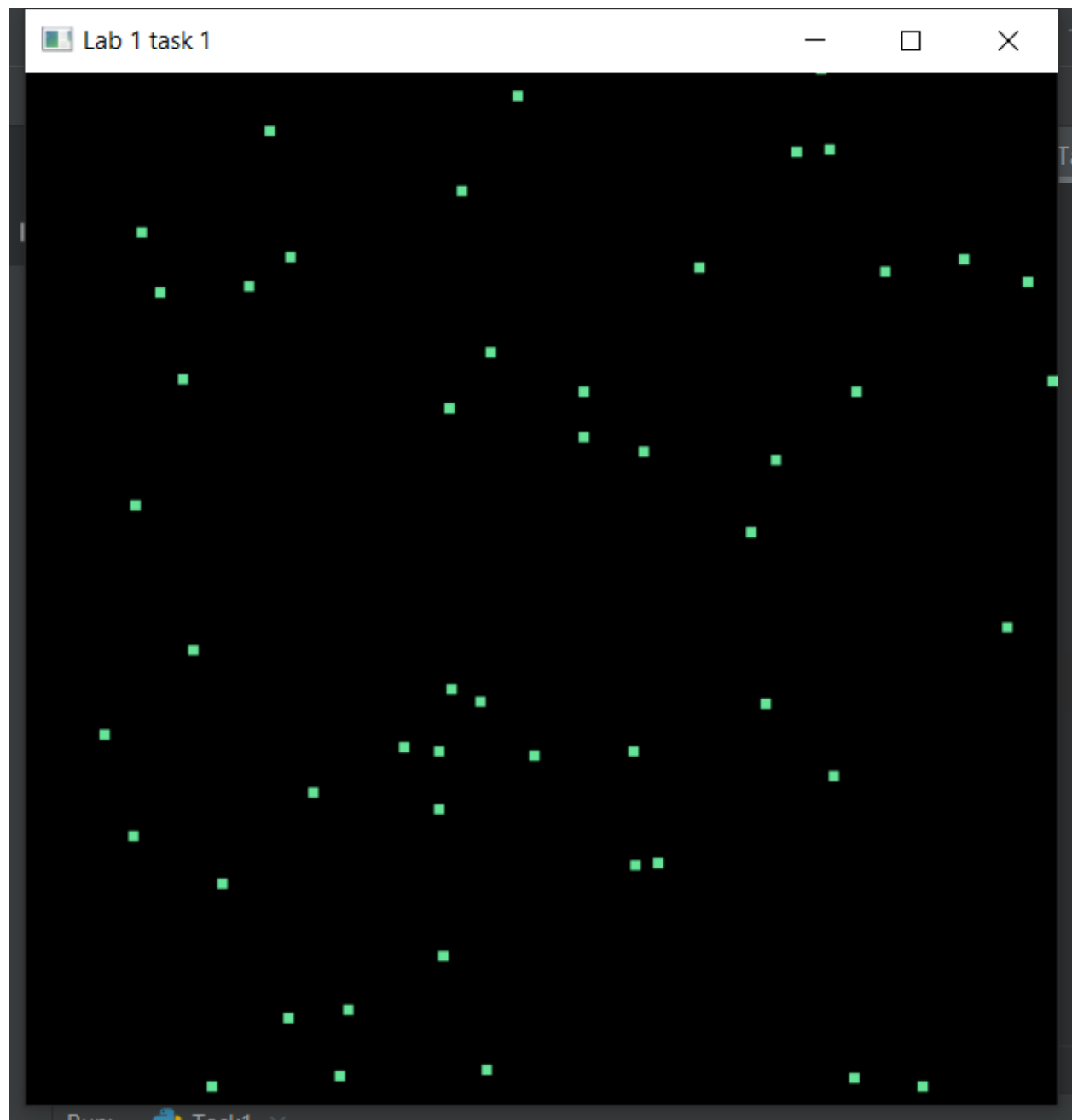
```
glutInitWindowPosition(0, 0)
```

```
wind = glutCreateWindow(b"Lab 1 task 1") #window name
```

```
glutDisplayFunc(showScreen)
```

```
glutMainLoop()
```

## Output



## Task 2

### Code

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

def draw_knob():
    glColor3f(1.0, 0.5, 0.0)

    glPointSize(5) #pixel size. by default 1 thake
    glBegin(GL_POINTS)
    glVertex2f(285, 125) #jekhane show korbe pixel
    glEnd()

def draw_triangle():
    glColor3f(0.0, 0.5, 1.0)

    glBegin(GL_TRIANGLES)
    glVertex2f(100, 350)
    glVertex2f(400, 350)
    glVertex2f(250, 500)
    glEnd()

def draw_square():
    glColor3f(1.0, 0.0, 1.0)

    glBegin(GL_LINES)
    glVertex(100, 50)
    glVertex(400, 50)

    glVertex(400, 50)
    glVertex(400, 350)

    glVertex(400, 350)
    glVertex(100, 350)

    glVertex(100, 350)
    glVertex(100, 50)
```

```
glEnd()
```

```
def draw_window():  
    glBegin(GL_QUADS)  
    glColor3f(1.0, 1.0, 0.0)
```

```
    # window 1  
    glVertex(120, 240)  
    glVertex(180, 240)  
    glVertex(180, 300)  
    glVertex(120, 300)
```

```
    # window 2  
    glVertex(320, 240)  
    glVertex(380, 240)  
    glVertex(380, 300)  
    glVertex(320, 300)
```

```
    glColor3f(0.4, 0.9, 0.6)  
    glEnd()
```

```
def draw_door():  
    glColor3f(0.4, 0.9, 0.6)
```

```
    glBegin(GL_LINES)  
    glVertex(210, 50)  
    glVertex(290, 50)
```

```
    glVertex(290, 50)  
    glVertex(290, 200)
```

```
    glVertex(290, 200)  
    glVertex(210, 200)
```

```
    glVertex(210, 200)  
    glVertex(210, 50)  
    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()
    #konokichur color set (RGB)
    #call the draw methods here

    draw_triangle()
    draw_square()

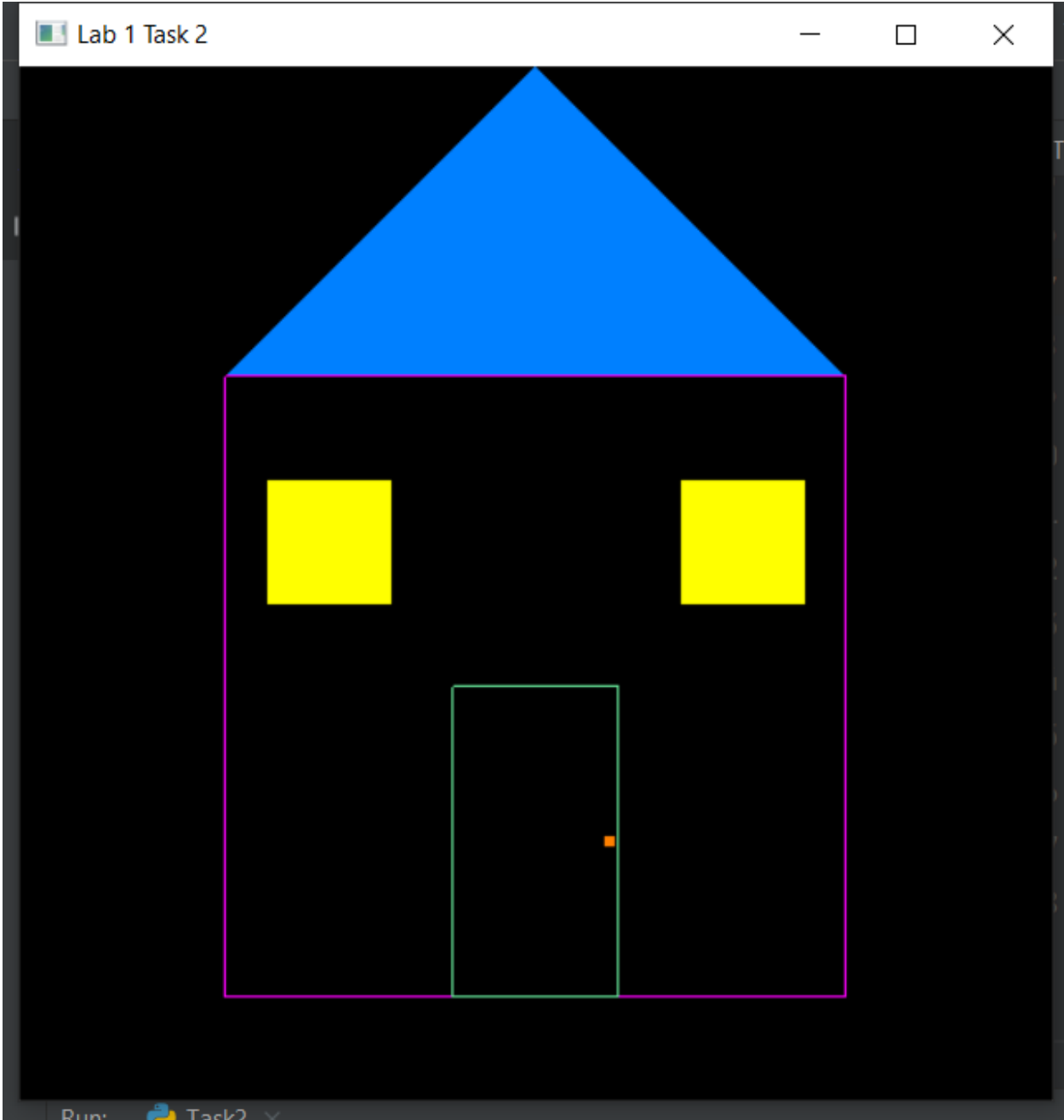
    draw_window()
    draw_door()

    draw_knob()
    glutSwapBuffers()
```

```
glutInit()
glutInitDisplayMode(GLUT_RGBA)
glutInitWindowSize(500, 500) #window size
glutInitWindowPosition(0, 0)
wind = glutCreateWindow(b"Lab 1 Task 2") #window name
glutDisplayFunc(showScreen)

glutMainLoop()
```

Output



## Task 3

### Code

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

def draw_points(x, y):
    glPointSize(5) #pixel size. by default 1 thake
    glBegin(GL_POINTS)
    glVertex2f(x,y) #jekhane show korbe pixel
    glEnd()

def draw_one(a, b, c, d):
    glLineWidth(10)
    glBegin(GL_LINES)
    glVertex2f(a, b)
    glVertex2f(c, d)
    glEnd()

def draw_first_one():
    glColor3f(1.0, 0.0, 0.0)
    draw_one(50, 50, 50, 150)

def draw_second_one():
    glColor3f(1.0, 0.0, 1.0)
    draw_one(150, 50, 150, 150)

def draw_third_one():
    glColor3f(0.0, 0.0, 0.0)
    draw_one(250, 50, 250, 150)

def draw_fourth_one():
    glColor3f(0.0, 0.8, 0.1)
    draw_one(280, 50, 280, 150)

def draw_nine():
    glLineWidth(10)
    glColor3f(0.0, 1.0, 1.0)
```



```
glBegin(GL_LINES)
```

```
# square
```

```
glVertex2f(80, 110)
```

```
glVertex2f(120, 110)
```

```
glVertex2f(120, 110)
```

```
glVertex2f(120, 150)
```

```
glVertex2f(120, 150)
```

```
glVertex2f(80, 150)
```

```
glVertex2f(80, 150)
```

```
glVertex2f(80, 110)
```

```
# stick
```

```
glVertex2f(120, 50)
```

```
glVertex2f(120, 110)
```

```
glEnd()
```

```
def draw_zero():
```

```
    glLineWidth(10)
```

```
    glColor3f(1.0, 1.0, 0.0)
```

```
    glBegin(GL_LINES)
```

```
# square
```

```
glVertex2f(180, 50)
```

```
glVertex2f(220, 50)
```

```
glVertex2f(220, 50)
```

```
glVertex2f(220, 150)
```

```
glVertex2f(220, 150)
```

```
glVertex2f(180, 150)
```

```
glVertex2f(180, 150)
```

```
glVertex2f(180, 50)
```

```
glEnd()
```

```
def draw_four():
```

```
glLineWidth(10)
glColor3f(1.0, 0.5, 0.0)
glBegin(GL_LINES)
```

```
# square
glVertex2f(310, 110)
glVertex2f(350, 110)
```

```
glVertex2f(350, 110)
glVertex2f(350, 150)
```

```
# glVertex2f(350, 150)
# glVertex2f(310, 150)
```

```
glVertex2f(310, 150)
glVertex2f(310, 110)
```

```
# stick
glVertex2f(350, 50)
glVertex2f(350, 110)
glEnd()
```

```
def draw_seven():
    glLineWidth(10)
    glColor3f(0.0, 0.5, 1.0)
    glBegin(GL_LINES)
```

```
# horizontal stick
glVertex2f(380, 150)
glVertex2f(420, 150)
```

```
# vertical stick
glVertex2f(420, 150)
glVertex2f(420, 50)
glEnd()
```

```
def iterate():
    glViewport(0, 0, 1000, 600)
    glMatrixMode(GL_PROJECTION)
    glLoadIdentity()
```

```
glOrtho(0.0, 500, 0.0, 500, 0.0, 1.0)
glMatrixMode (GL_MODELVIEW)
glLoadIdentity()
```

```
def showScreen():
```

```
    # setting the bg color to white
    glClearColor(1.0, 1.0, 1.0, 1.0)
    glClear(GL_COLOR_BUFFER_BIT)
    # glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT)
    glLoadIdentity()
    iterate()
    # glColor3f(0.5, 0.4, 1.0) #konokichur color set (RGB)
    #call the draw methods here
```

```
    draw_first_one()
    draw_nine()
```

```
    draw_second_one()
    draw_zero()
```

```
    draw_third_one()
    draw_fourth_one()
```

```
    draw_four()
    draw_seven()
    glutSwapBuffers()
```

```
glutInit()
glutInitDisplayMode(GLUT_RGBA)
glutInitWindowSize(1000, 250) #window size
glutInitWindowPosition(0, 0)
wind = glutCreateWindow(b"Lab 1 Task 3") #window name
glutDisplayFunc(showScreen)
```

```
glutMainLoop()
```

Output

Lab 1 Task 3

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