Computer graphics and multimedia

Lab task 4

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Slot: L3+L4

2D CLIPPING

Code

The rectangle is being rotated. It is always positioned in the middle of the panel

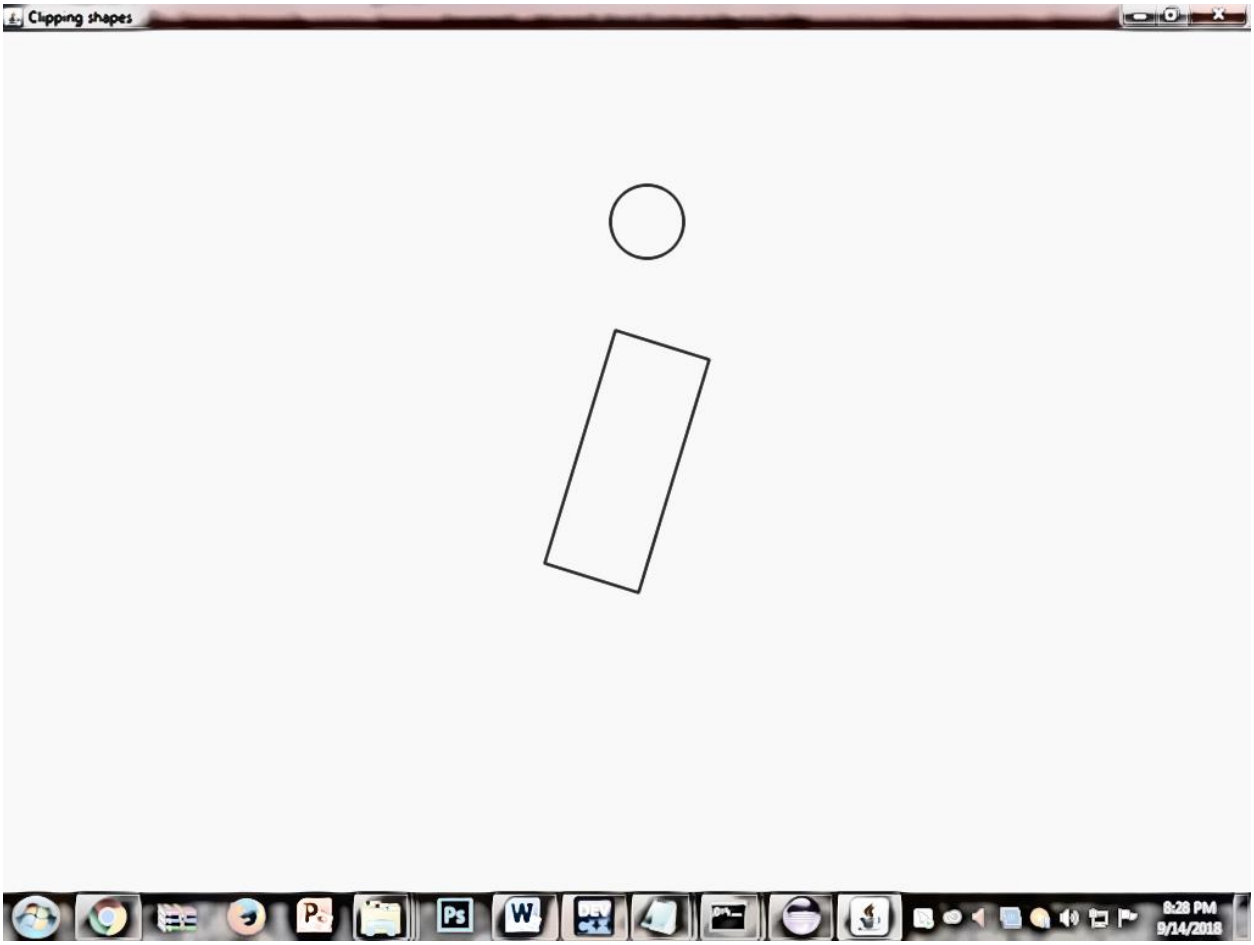
```
import java.awt.Color;
import java.awt.EventQueue;
import java.awt.Graphics;
import java.awt.Graphics2D;
import java.awt.Rectangle;
import java.awt.RenderingHints;
import java.awt.Shape;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.awt.geom.AffineTransform;
import java.awt.geom.Ellipse2D;
import java.awt.geom.GeneralPath;
import javax.swing.JFrame;
import javax.swing.JPanel;
import javax.swing.Timer;


class Surface extends JPanel
      implements ActionListener {

   /**
           *
           */
          private static final long serialVersionUID = 1L;
          private Timer timer;
   private double rotate = 1;
   private int pos_x = 8;
   private int pos_y = 8;
   private final double delta[] = {1, 1};

   private final int RADIUS = 60;


   public Surface() {

      initTimer();
   }

   private void initTimer() {
```

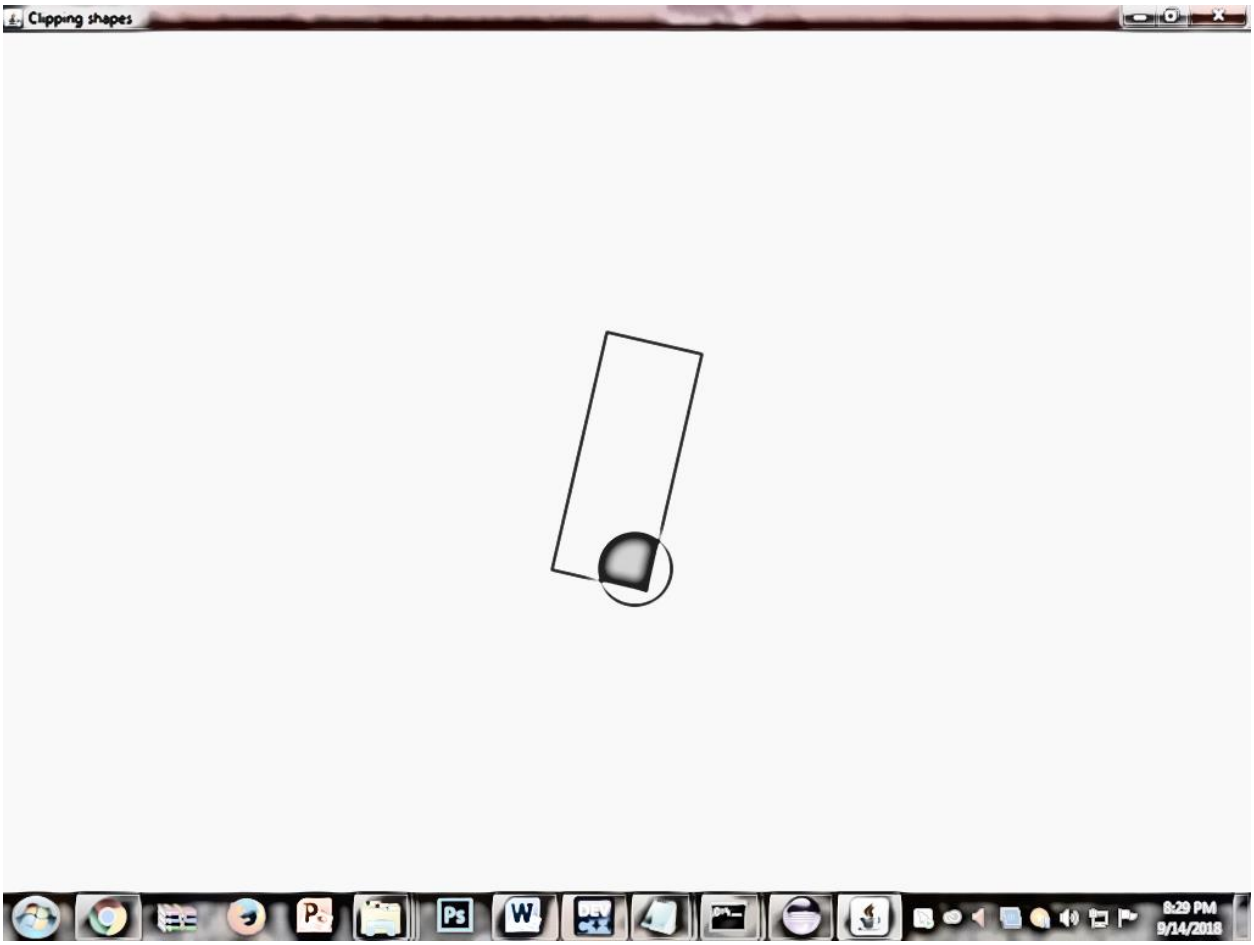
```
    timer = new Timer(10, this);
    timer.start();
}

private void doDrawing(Graphics g) {

    Graphics2D g2d = (Graphics2D) g;

    g2d.setRenderingHint(RenderingHints.KEY_ANTIALIASING,
            RenderingHints.VALUE_ANTIALIAS_ON);

    g2d.setRenderingHint(RenderingHints.KEY_RENDERING,
            RenderingHints.VALUE_RENDER_QUALITY);

    Shape oldClip = g2d.getClip();

    int w = getWidth();
    int h = getHeight();

    Rectangle rect = new Rectangle(0, 0, 200, 80);

    AffineTransform tx = new AffineTransform();
    tx.rotate(Math.toRadians(rotate), w / 2, h / 2);
    tx.translate(w / 2 - 100, h / 2 - 40);

    Ellipse2D circle = new Ellipse2D.Double(pos_x, pos_y,
            RADIUS, RADIUS);

    GeneralPath path = new GeneralPath();
    path.append(tx.createTransformedShape(rect), false);

    g2d.clip(circle);
    g2d.clip(path);

    g2d.setPaint(new Color(110, 110, 110));
    g2d.fill(circle);

    g2d.setClip(oldClip);

    g2d.draw(circle);
    g2d.draw(path);
}


public void paintComponent(Graphics g) {
    super.paintComponent(g);

    doDrawing(g);
}

public void step() {
```

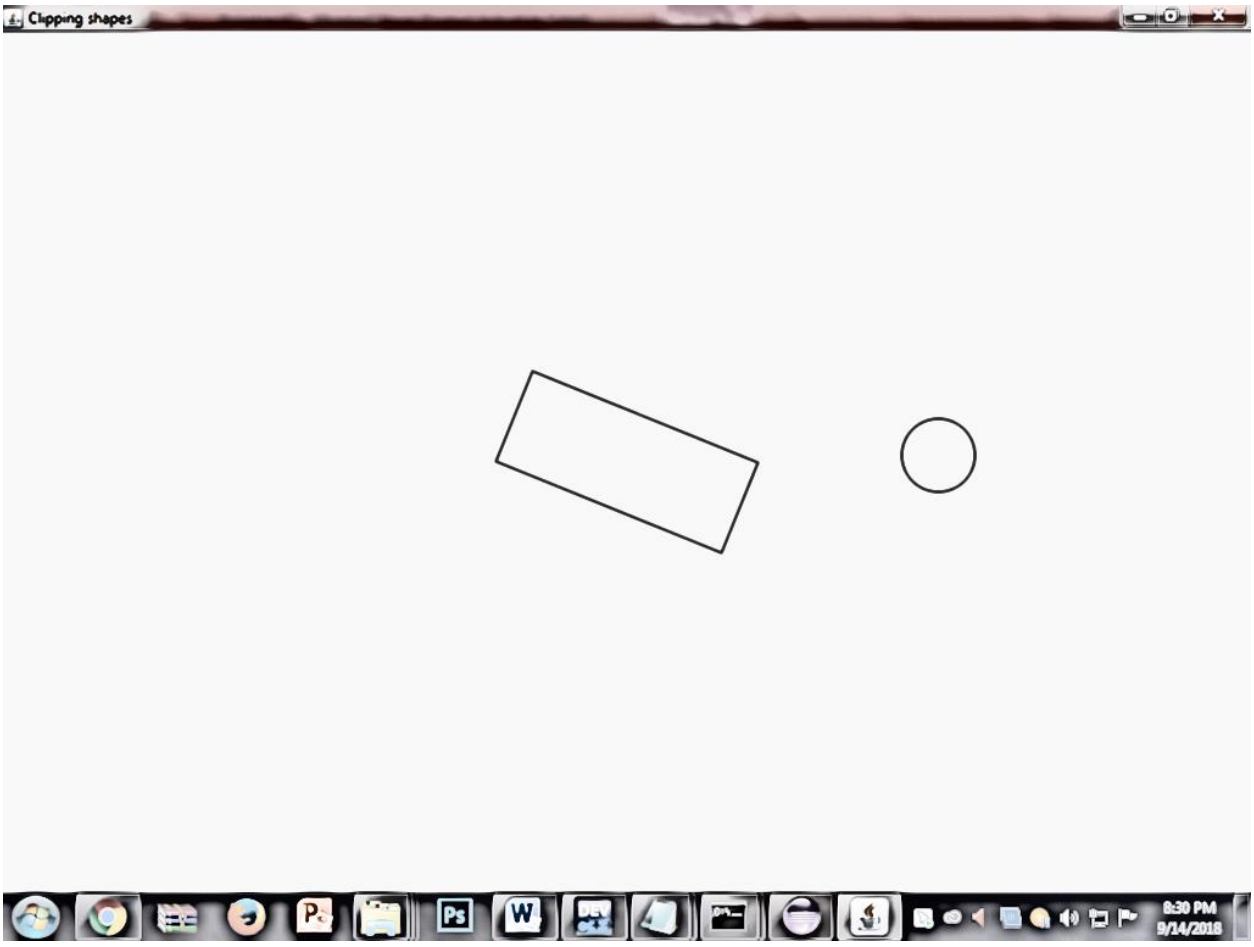
```
        int w = getWidth();
        int h = getHeight();

        rotate += 1;

        if (pos_x < 0) {

            delta[0] = 1;
        } else if (pos_x > w - RADIUS) {

            delta[0] = -1;
        }

        if (pos_y < 0) {

            delta[1] = 1;
        } else if (pos_y > h - RADIUS) {

            delta[1] = -1;
        }

        pos_x += delta[0];
        pos_y += delta[1];
    }


    public void actionPerformed(ActionEvent e) {

        step();
        repaint();
    }
}

public class ClippingShapesEx extends JFrame {

    /**
             *
             */
            private static final long serialVersionUID = 1L;

            public ClippingShapesEx() {

        initUI();
    }

    private void initUI() {

        setTitle("Clipping shapes");

        add(new Surface());
```

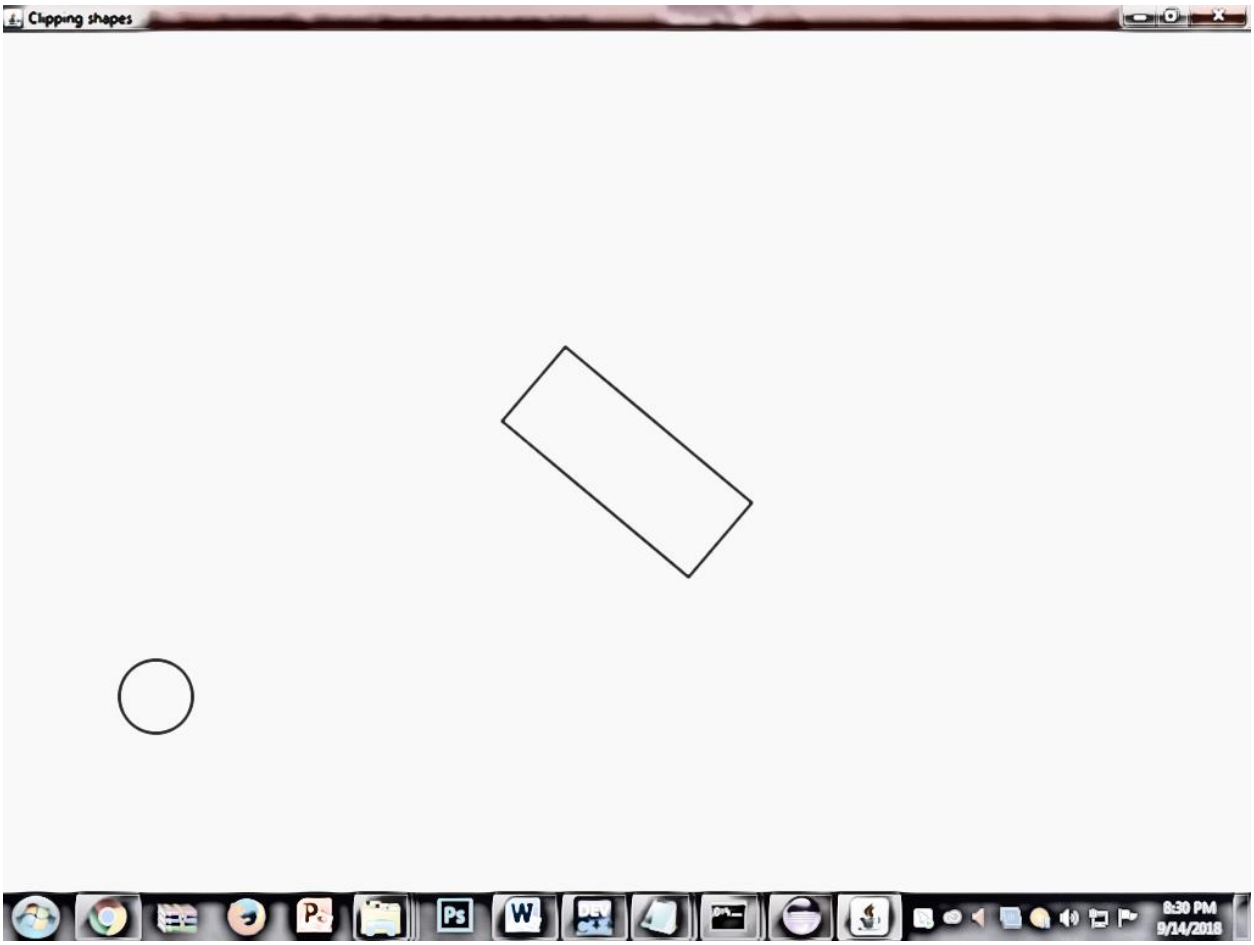
```
        setSize(350, 300);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setLocationRelativeTo(null);
    }

    public static void main(String[] args) {

        EventQueue.invokeLater(new Runnable() {


            public void run() {
                ClippingShapesEx ex = new ClippingShapesEx();
                ex.setVisible(true);
            }
        });
    }
}
```

Output:




Clipping shapes
8:29 PM
9/14/2018


Clipping shapes
8:30 PM
9/24/2018


Clipping shapes
8:30 PM
9/24/2018

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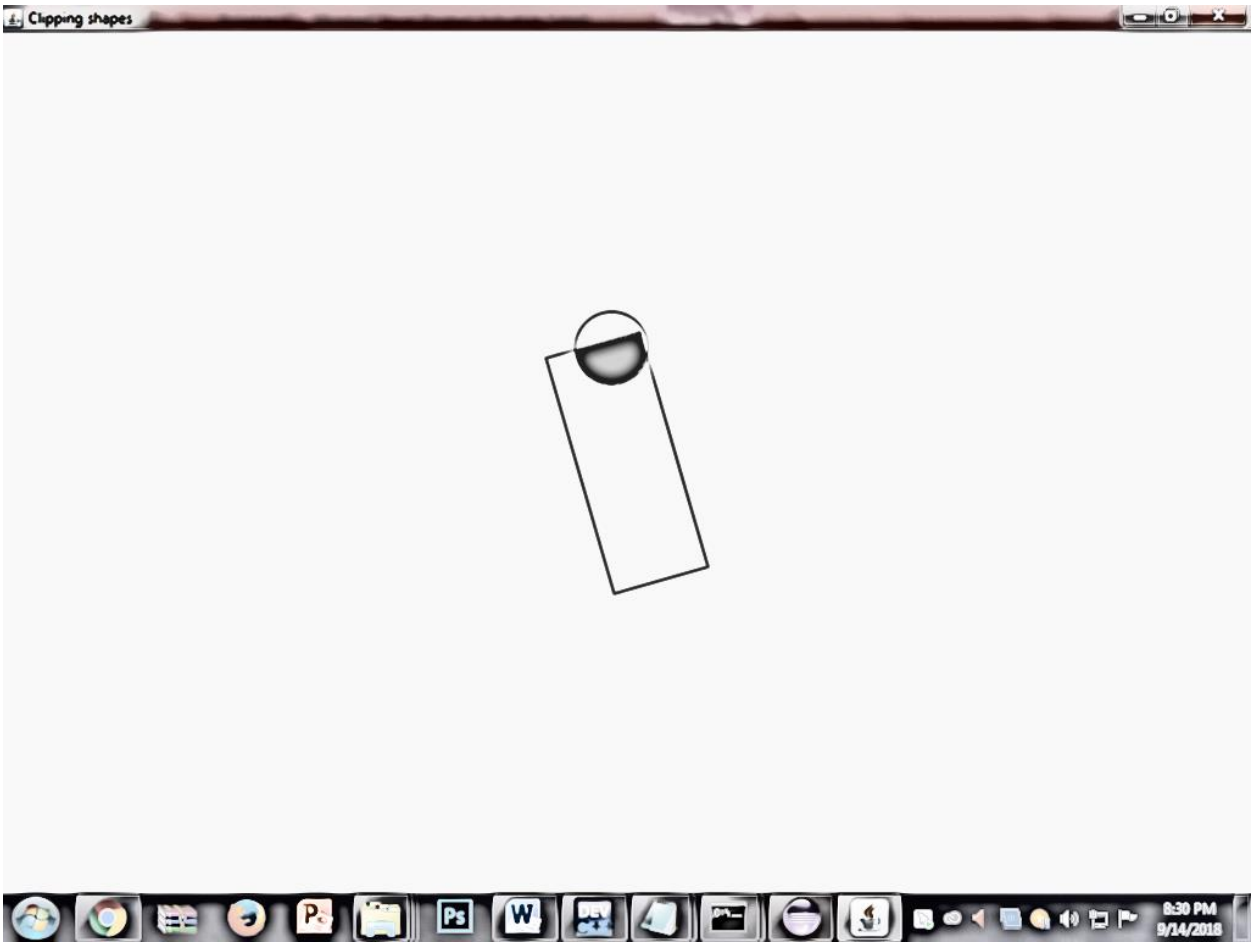

End.