南开大学

JAVA语言与应用

画图程序实验报告

姓 名：冯朝芃

学 号：2012039

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学 院： 计算机学院

专 业 ：计算机科学与技术

授课教师：刘嘉欣

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一、概述：

本作业为基于Swing的画图程序。本作业实现的功能有：画出矩形、三角形、椭圆形、直线，选择是否填充等功能。本代码使用了MVC架构进行开发，充分利用了Java的面向对象编程思想，一定程度上具有可扩展性高，代码逻辑框架清晰，复用性强、事件处理流程明确等特点。

由于作者水平和精力有限，本程序保存作图、撤销操作等功能还在完善中。

二、运行展示：

运行效果截图：

图形用户界面

中度可信度描述已自动生成图形用户界面, 应用程序, 表格, Excel

描述已自动生成

图形用户界面, 应用程序

描述已自动生成图表, 箱线图

描述已自动生成

附录：完整代码

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『Manage.java』

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package manager;

import viewer.Viewer;

import javax.swing.\*;

public class Manage {

    private JFrame mainWindow;

    private Viewer viewer;

    void init(){

        mainWindow = new JFrame();

        viewer = new Viewer(mainWindow);

        viewer.init();

        viewer.show();

        while(true){

            //viewer.drawPanel.drawLine(200,200,100,100);

            viewer.update();

        }

    }

    public static void main(String[] args){

        Manage manage = new Manage();

        manage.init();

    }

}

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『store.java』

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package storer;

import java.util.Queue;

public class store {

    public Queue<String> queue;

}

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『background.java』

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package viewer;

import javax.swing.\*;

import java.awt.\*;

public class background extends JPanel {

    background(){

        setLayout(new GridLayout(1,2));

        setBackground(new java.awt.Color(255, 255, 255));

        setPreferredSize(new java.awt.Dimension(50, 50));

        JLabel label = new JLabel("Background");

        label.setHorizontalAlignment(JLabel.CENTER);

        add(label);

        JComboBox comboBox = new JComboBox();

        comboBox.addItem("Red");

        comboBox.addItem("Green");

        comboBox.addItem("Blue");

        add(comboBox);

    }

}

＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝

『buttonSet.java』

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package viewer;

import javax.swing.\*;

import java.awt.event.ActionEvent;

import java.awt.event.ActionListener;

import java.util.Vector;

class triangularButton extends JButton {

    triangularButton() {

        super("Triangle");

        setPreferredSize(new java.awt.Dimension(100, 80));

        setContentAreaFilled(true);

        setVisible(true);

        //addActionListener(new Actiona);

    }

}

class rectangularButton extends JButton {

    rectangularButton(){

        super("Rectangle");

        setPreferredSize(new java.awt.Dimension(100, 80));

        setContentAreaFilled(true);

        setVisible(true);

    }

}

class ovalButton extends JButton {

    ovalButton(){

        super("Oval");

        setPreferredSize(new java.awt.Dimension(100, 80));

        setContentAreaFilled(true);

        setVisible(true);

    }

}

class roundButton extends JButton {

    roundButton(){

        super("Round");

        setPreferredSize(new java.awt.Dimension(100, 80));

        setContentAreaFilled(true);

        setVisible(true);

    }

}

class lineButton extends JButton {

    lineButton(){

        super("Line");

        setPreferredSize(new java.awt.Dimension(100, 80));

        setContentAreaFilled(true);

        setVisible(true);

    }

}

public class buttonSet extends JButton {

    public static Vector<JButton> buttons;

    public static JButton selected=new lineButton();

    class buttonListener implements ActionListener {

        @Override

        public void actionPerformed(ActionEvent e) {

            selected = (JButton) e.getSource();

            //System.out.println("Selected: " + selected.getText());

        }

    }

    public buttonSet() {

        buttons = new Vector<JButton>();

        buttons.add(new triangularButton());

        buttons.add(new rectangularButton());

        buttons.add(new ovalButton());

        buttons.add(new roundButton());

        buttons.add(new lineButton());

        for (JButton b : buttons) {

            b.addActionListener(new buttonListener());

        }

    }

}

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『drawPanel.java』

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package viewer;

import javax.swing.\*;

import java.awt.\*;

import java.awt.event.MouseListener;

import java.awt.geom.\*;

import static java.lang.Math.abs;

public class drawPanel extends JPanel {

    public int x,x1,x2;

    public int y,y1,y2;

    private int width = 0;

    private int height = 0;

    private Graphics g;

    // Constructor

    public drawPanel() {

        super();

        setPreferredSize(new java.awt.Dimension(500, 500));

        setBackground(java.awt.Color.white);

        //setVisible(true);

        addMouseListener(new MouseListener() {

            @Override

            public void mouseClicked(java.awt.event.MouseEvent e) {

                x = e.getX();

                y = e.getY();

                //repaint();

            }

            @Override

            public void mousePressed(java.awt.event.MouseEvent e) {

                x1 = e.getX();

                y1 = e.getY();

                repaint();

            }

            @Override

            public void mouseReleased(java.awt.event.MouseEvent e) {

                x2 = e.getX();

                y2 = e.getY();

                repaint();

                //x1 = 0;

                //x2 = 0;

                //y1 = 0;

                //y2 = 0;

            }

            @Override

            public void mouseEntered(java.awt.event.MouseEvent e) {

//                x1 = e.getX();

//                y1 = e.getY();

//                x2 = e.getX();

//                y2 = e.getY();

                repaint();

            }

            @Override

            public void mouseExited(java.awt.event.MouseEvent e) {

                x = e.getX();

                y = e.getY();

                //repaint();

            }

        }

        );

    }

    @Override

    public void paint(Graphics g) {

        super.paint(g);

        //g.drawLine(200, 200, 400, 400);

    }

    @Override

    public void repaint() {

        super.repaint();

        //drawLine(x1, y1, x2, y2);

    }

    //draw a line on the panel with the given coordinates

    public void drawLine(int x1, int y1, int x2, int y2) {

        Graphics g = getGraphics();

        g.drawLine(x1, y1, x2, y2);

    }

    public void drawRectangle(int x1, int y1, int x2, int y2,boolean fill, Color color) {

        Graphics g = getGraphics();

        if(fill) {

            g.setColor(color);

            g.fillRect(x1, y1, abs(x1-x2), abs(y1-y2));

        }else {

            g.drawRect(x1, y1, abs(x1 - x2), abs(y1 - y2));

        }

    }

    public void drawCircle(int x1, int y1, int x2, int y2,boolean fill, Color color) {

        Graphics g = getGraphics();

        if(fill){

            g.setColor(color);

            g.fillOval(x1, y1, abs(x1-x2), abs(y1-y2));

        }else {

            g.drawOval(x1, y1, abs(x1-x2), abs(y1-y2));

        }

    }

    public void drawTriangle(int x1, int y1, int x2, int y2,boolean fill, Color color) {

        Graphics g = getGraphics();

        int[] xPoints = {x1, x2, (x1+x2)/2};

        int[] yPoints = {y1, y2, (y1+y2)/2};

        if(fill){

            g.setColor(color);

            g.fillPolygon(xPoints, yPoints, 3);

        }else

        g.drawPolygon(xPoints, yPoints, 3);

    }

    public void drawRound(int x1, int y1, int x2, int y2,boolean fill, Color color) {

        Graphics g = getGraphics();

        if(fill) {

            g.setColor(color);

            g.fillRoundRect(x1, y1, abs(x1-x2), abs(y1-y2), abs(x1-x2), abs(y1-y2));

        }else

        g.drawRoundRect(x1, y1, abs(x1-x2), abs(y1-y2), 10, 10);

    }

    public void drawText(int x, int y,String text, Color color) {

        Graphics g = getGraphics();

        g.setColor(color);

        g.drawString(text, x, y);

    }

}

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『fillRegion.java』

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package viewer;

import javax.swing.\*;

import javax.swing.event.ChangeListener;

import java.awt.\*;

public class fillRegion extends JPanel {

    public JCheckBox checkBox;

    public boolean isChecked;

    class fillRegionListener implements ChangeListener {

        public void stateChanged(javax.swing.event.ChangeEvent e) {

            isChecked = checkBox.isSelected();

        }

    }

    fillRegion(){

        setLayout(new GridLayout(1,1));

        setVisible(true);

        checkBox = new JCheckBox("Fill Region");

        checkBox.addChangeListener(new fillRegionListener());

        add(checkBox);

    }

}

＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝

『leftControlBar.java』

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package viewer;

import javax.swing.\*;

import java.util.Vector;

public class leftControlBar extends JPanel {

    public static buttonSet buttonSet;

    public void addAll(Vector buttons){

        for(Object button : buttons){

            this.add((JComponent)button);

        }

    }

    leftControlBar(){

        this.setPreferredSize(new java.awt.Dimension(100, 550));

        this.setBackground(new java.awt.Color(108, 108, 108));

        //this.setVerticalScrollBarPolicy(JScrollPane.VERTICAL\_SCROLLBAR\_NEVER);

        //this.setHorizontalScrollBarPolicy(JScrollPane.HORIZONTAL\_SCROLLBAR\_AS\_NEEDED);

        buttonSet = new buttonSet();

        this.addAll(viewer.buttonSet.buttons);

    }

}

＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝

『shapeColor.java』

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package viewer;

import javax.swing.\*;

import javax.swing.event.ChangeListener;

import java.awt.\*;

import java.awt.event.ActionListener;

public class shapeColor extends JPanel {

    public Color color=Color.RED;

    public JComboBox comboBox;

    class ComboBoxListener implements ActionListener {

        public void actionPerformed(java.awt.event.ActionEvent e) {

            //convert to Color

            String colorName = (String) comboBox.getSelectedItem();

            color = Color.decode(colorName);

        }

    }

    shapeColor(){

        setLayout(new GridLayout(1,2));

        setBackground(new java.awt.Color(255, 255, 255));

        setPreferredSize(new java.awt.Dimension(50, 50));

        JLabel label = new JLabel("Set Color");

        label.setHorizontalAlignment(JLabel.CENTER);

        add(label);

        comboBox = new JComboBox();

        comboBox.addItem("Red");

        comboBox.addItem("Green");

        comboBox.addItem("Blue");

        comboBox.addActionListener(new ComboBoxListener());

        add(comboBox);

    }

    public Color getColor() {

        return color;

    }

}

＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝

『textSetter.java』

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package viewer;

import javax.swing.\*;

import java.awt.\*;

public class textSetter extends JPanel {

    textSetter(){

        setLayout(new GridLayout(1,3));

        JTextField textField = new JTextField();

        textField.setText("Enter text here");

        add(textField);

        JLabel label = new JLabel("size:");

        add(label);

        JTextField fontSize = new JTextField("14");

        fontSize.add(new JScrollBar(JScrollBar.HORIZONTAL));

        add(fontSize);

    }

}

＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝＝

『TopPanel.java』

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package viewer;

import javax.swing.\*;

import java.awt.\*;

public class TopPanel extends JPanel {

    public static shapeColor color;

    public static background background;

    public static textSetter textSetter;

    public static fillRegion fillRegion;

    TopPanel() {

        setLayout(new GridLayout(1,2));

        setPreferredSize(new Dimension(800, 50));

        setBackground(Color.WHITE);

        setBorder(BorderFactory.createMatteBorder(0, 0, 1, 0, Color.BLACK));

        JPanel leftPanel = new JPanel();

        leftPanel.setLayout(new GridLayout(2,1));

        leftPanel.setPreferredSize(new Dimension(400, 23));

        leftPanel.setBackground(Color.WHITE);

        color = new shapeColor();

        leftPanel.add(color);

        background = new background();

        leftPanel.add(background);

        JPanel rightPanel = new JPanel();

        rightPanel.setLayout(new GridLayout(2,1));

        rightPanel.setPreferredSize(new Dimension(400, 23));

        rightPanel.setBackground(Color.PINK);

        textSetter = new textSetter();

        rightPanel.add(textSetter);

        fillRegion = new fillRegion();

        rightPanel.add(fillRegion);

        this.add(leftPanel);

        this.add(rightPanel);

    }

}

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『Viewer.java』

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package viewer;

import javax.swing.\*;

import java.awt.\*;

public class Viewer {

    private JFrame mainFrame;

    private TopPanel topPanel;

    private leftControlBar leftControlBar;

    //private buttonSet buttonSet;

    private drawPanel drawPanel;

    public Viewer(JFrame main) {

        mainFrame = main;

    }

    public void update() {

        switch(buttonSet.selected.getText()){

            case "Line":

                System.out.println("draw Line");

                drawPanel.drawLine(drawPanel.x1,drawPanel.y1, drawPanel.x2,drawPanel.y2);

                break;

                case "Rectangle":

                    System.out.println("draw Rectangle");

                drawPanel.drawRectangle(drawPanel.x1,drawPanel.y1, drawPanel.x2,drawPanel.y2,topPanel.fillRegion.isChecked,topPanel.color.getColor());

                break;

                case "Oval":

                drawPanel.drawCircle(drawPanel.x1,drawPanel.y1, drawPanel.x2,drawPanel.y2,topPanel.fillRegion.isChecked,topPanel.color.getColor());

                break;

                case "Triangle":

                drawPanel.drawTriangle(drawPanel.x1,drawPanel.y1, drawPanel.x2,drawPanel.y2,topPanel.fillRegion.isChecked,topPanel.color.getColor());

                break;

            case"Round":

                drawPanel.drawRound(drawPanel.x1,drawPanel.y1, drawPanel.x2,drawPanel.y2,topPanel.fillRegion.isChecked,topPanel.color.getColor());

                break;

            default:

        }

        //mainFrame.repaint();

    }

    public void init() {

        mainFrame.setTitle("Painter");

        mainFrame.setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

        mainFrame.setSize(800, 600);

        mainFrame.setLocationRelativeTo(null);

        mainFrame.setBackground(new java.awt.Color(255, 255, 255));

        mainFrame.setLayout(new BorderLayout());

        topPanel = new TopPanel();

        mainFrame.add(topPanel, BorderLayout.NORTH);

        leftControlBar = new viewer.leftControlBar();

        mainFrame.add(leftControlBar, BorderLayout.WEST);

        drawPanel = new drawPanel();

        mainFrame.add(drawPanel, BorderLayout.CENTER);

    }

    public void show() {

        mainFrame.setVisible(true);

    }

}