**Course: ENSF 614 – Fall 2021**

**Lab 7**

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**Exercise A and B:**

**DemoDecoratorPattern.java**

**\*\*The source code for exercises A and B are identical except for portions in the DemoDecoratorPattern.java file (commented out for relevant exercise)\*\***

import java.awt.Font;  
import java.awt.Graphics;  
import javax.swing.JFrame;  
import javax.swing.JPanel;  
  
public class DemoDecoratorPattern extends JPanel {  
 Component t;  
   
 public DemoDecoratorPattern(){  
 t = new Text ("Hello World", 60, 80);   
 }  
   
 public void paintComponent(Graphics g){  
  
 int fontSize = 10;  
 //portion for Exercise A  
 /\*  
 g.setFont(new Font("TimesRoman", Font.PLAIN, fontSize));  
  
 // Now lets decorate t with BorderDecorator: x = 30, y = 30, width = 100, and height 100  
 t = new BorderDecorator(t, 30, 30, 100, 100);  
  
 // Now lets add a ColouredFrameDecorator with x = 25, y = 25, width = 110, height = 110,  
 // and thickness = 10.  
 t = new ColouredFrameDecorator(t, 25, 25, 111, 111, 10);  
  
 // Now lets draw the product on the screen  
  
 t = new ColouredGlassDecorator(t, 25, 25, 110, 110);  
 t.draw(g);  
 \*/  
  
 //portion for exercise B:  
 g.setFont(new Font("TimesRoman", Font.*PLAIN*, fontSize));// GlassFrameDecoratorinfo: x = 25, y = 25, width = 110, and height = 110  
 t= new ColouredGlassDecorator(  
 new ColouredFrameDecorator(  
 new BorderDecorator(  
 t, 30, 30, 100, 100), 25, 25, 110, 110, 10), 25, 25,110, 110);  
 t.draw(g);  
  
 }  
   
 public static void main(String[] args) {   
 DemoDecoratorPattern panel = new DemoDecoratorPattern();  
 JFrame frame = new JFrame("Learning Decorator Pattern");  
 frame.getContentPane().add(panel);  
 frame.setSize(400,400);  
 frame.setDefaultCloseOperation(JFrame.*EXIT\_ON\_CLOSE*);  
 frame.setLocationRelativeTo(null);  
 frame.setVisible(true);  
 Graphics g = panel.getGraphics();  
 panel.paintComponent(g);  
  
  
 frame.setVisible(true);  
  
  
 }  
}

**Text.java**

import java.awt.\*;  
  
  
public class Text implements Component{  
  
 int x;  
 int y;  
 String text;  
  
 public Text(String text, int x, int y) {  
 this.text = text;  
 this.x = x;  
 this.y =y ;  
 }  
  
 public void draw(Graphics g){  
 g.setColor(new Color(0,100,0));  
 g.drawString(text, x, y);  
  
 }  
}

**Decorator.java**

public abstract class Decorator implements Component{  
 Component cmp;  
 int x;  
 int y;  
 int width;  
 public int height;  
  
 public Decorator(Component cmp, int x, int y, int width, int height){  
 this. cmp = cmp;  
 this.x = x;  
 this.y = y;  
 this.width=width;  
 this.height = height;  
 }  
  
  
}

**Component.java**

import java.awt.\*;  
  
public interface Component {  
 public void draw(Graphics g);  
}

**BorderDecorator.java**

import java.awt.\*;  
  
public class BorderDecorator extends Decorator{  
  
 public BorderDecorator(Component cmp, int x, int y, int width, int height) {  
 super(cmp, x, y, width, height);  
 }  
  
 public void draw(Graphics g){  
 cmp.draw(g);  
  
 Graphics2D g2 = (Graphics2D) g;  
 Stroke oldStroke = g2.getStroke();  
 Stroke dashes = new BasicStroke(2,  
 BasicStroke.*CAP\_BUTT*,  
 BasicStroke.*JOIN\_BEVEL*,  
 0,  
 new float[]{4},  
 0);  
 g2.setStroke(dashes);  
 g2.drawLine(x, y, x+width, y);  
 g2.drawLine(x, y, x, y+height);  
 g2.drawLine(x+width, y, x+width, y+height);  
 g2.drawLine(x, y+height, x+width, y+height);  
  
 g2.setStroke(oldStroke);  
  
  
  
  
  
 }  
}

**ColouredFrameDecorator.java**

import java.awt.\*;  
  
public class ColouredFrameDecorator extends Decorator{  
 int thickness;  
  
 public ColouredFrameDecorator(Component cmp, int x, int y, int width, int height, int thickness) {  
 super(cmp, x, y, width, height);  
 this.thickness = thickness;  
 }  
  
 public void draw(Graphics g){  
 cmp.draw(g);  
 Graphics2D g2 = (Graphics2D) g;  
 Stroke oldStroke = g2.getStroke();  
 Color oldColor = g2.getColor();  
 g2.setStroke(new BasicStroke(thickness));  
 g2.setColor(Color.*red*);  
 g2.drawRect(x, y, width, height);  
 g2.setStroke(oldStroke);  
 g2.setColor(oldColor);  
  
 }  
}

**ColouredGlassDectorator.java**

import java.awt.\*;  
  
public class ColouredGlassDecorator extends Decorator{  
  
  
 public ColouredGlassDecorator(Component cmp, int x, int y, int width, int height){  
 super(cmp, x, y, width, height);  
 }  
  
  
 public void draw(Graphics g){  
 cmp.draw(g);  
 Color c = new Color(124, 252, 0, 20);  
 g.setColor(c);  
 g.fillRect(x, y, width, height);  
  
  
 }  
}

**Program Output Exercise A:**

Graphical user interface, application

Description automatically generated

**Program Output Exercise B:**

Graphical user interface, application

Description automatically generated

**Exercise C: Developing Singleton Pattern in C++**