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Final

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1, Write a class ClockIcon that implements the Icon interface type. Draw an analog clock whose hour, minute, and second hands show the current time. To get the current hours and minutes, construct an object of type Gregorian Calendar with the default constructor. Write a test program.

import java.awt.\*;

import java.awt.event.\*;

import javax.swing.\*;

import java.util.Calendar;

import java.util.GregorianCalendar;

public class ClockIcon <Calender> extends JFrame implements ActionListener{

int x, y, xx, yy, rad, heg, Ox, Oy, Om\_x, Om\_y, Oh\_x, Oh\_y, ss,mm,hh,O m,O\_h,angL;

final double RAD = Math.PI/180;

public ClockIcon (){

super("ClockIcon");

setDefaultCloseOperation(3);

Image ClockImage = getToolkit().getImage("clock.gif");

setIconImage(ClockImage);

setSize(500,500);

setBackground(Color.black);

setLocation(400,250);

setResizable(false);

show();

int delay = 1000;

ActionListener drawClock = new ActionListener(){

public void actionPerformed(ActionEvent evt){

repaint();

}

};

new Timer(delay,drawClock).start();

}

public void actionPerformed(ActionEvent evt){}

public void paint(Graphics g){

Graphics2D g2D = (Graphics2D)g;

Insets insets = getInsets();

int L = insets.left/2, T = insets.top/2;

heg = getSize().height;

g.setColor(Color.yellow);

// draw circle

g2D.setStroke(new BasicStroke(4.0f));

g.drawOval(L+40, T+40, heg-80, heg-80);

rad= heg/2 - 40;

xx = 40 + rad - 5 + L;

yy = 40 + rad - 5 - T;

angL = 60;

for(int i = 1;i <= 12;i ++){

x = (int)((rad+10)\*Math.cos(RAD\*angL)+xx);

y = (int)((rad+10)\*Math.sin(RAD\*angL)+yy);

g.drawString(""+i, x, heg-y);

angL -=30;

}

//get current time

Calendar now = new GregorianCalendar();

int nowh = now.get(Calendar.HOUR\_OF\_DAY);

int nowm = now.get(Calendar.MINUTE);

int nows = now.get(Calendar.SECOND);

String st;

if(nowh < 10)st = "0"+nowh;

else st = ""+nowh;

if(nowm<10)st += ":0"+nowm;

else st += ":"+nowm;

if(nows<10)st += ":0"+nows;

else st += ":"+nows;

//show current time

g.setColor(Color.green);

g.fillRect(L, T, 50, 28);

g.setColor(Color.blue);

g.drawString(st,L+2,T+26);

ss = 90 - nows\*6;

mm = 90 - nowm\*6;

hh = 90 - nowh\*30 - nowm/2;

xx = rad+40+L;

yy = rad+40+T;

g2D.setStroke(new BasicStroke(1.2f));

if(Os\_x > 0){

g.setColor(getBackground());

g.drawLine(xx,yy,Os\_x,heg-Os\_y);

}

else{

O\_m = mm;

O\_h = hh;

}

x = (int)(rad\*0.9\*Math.cos(RAD\*ss))+xx;

y = (int)(rad\*0.9\*Math.sin(RAD\*ss))+yy-2\*T;

g.setColor(Color.yellow);

g.drawLine(xx,yy,x,heg-y);

O\_x = x;

O\_y = y;

g2D.setStroke(new BasicStroke(2.2f));

if(O\_m!=mm){

g.setColor(getBackground());

g.drawLine(xx,yy,Om\_x,heg-Om\_y);

}

x = (int)(rad\*0.7\*Math.cos(RAD\*mm))+xx;

y = (int)(rad\*0.7\*Math.sin(RAD\*mm))+yy-2\*T;

g.setColor(Color.green);

g.drawLine(xx,yy,x,heg-y);

Om\_x = x;

Om\_y = y;

O\_m = mm;

g2D.setStroke(new BasicStroke());

if(O\_h!=hh){

g.setColor(getBackground());

g.drawLine(xx,yy,Oh\_x,heg-Oh\_y);

}

x = (int)(rad\*0.5\*Math.cos(RAD\*hh))+xx;

y = (int)(rad\*0.5\*Math.sin(RAD\*hh))+yy-2\*T;

g.setColor(Color.red);

g.drawLine(xx,yy,x,heg-y);

Oh\_x = x;

Oh\_y = y;

O\_h = hh;

}

public static void main(String[] args){

ClockIcon c = new ClockIcon ();

}

}

2,

import java.lang.reflect.AccessibleObject;

import java.lang.reflect.Field;

import java.util.ArrayList;

import java.util.List;

public class dumpClass {

private dumpClass) {}

public static String toString( Object A ) {

ArrayList<String> list = new ArrayList<String>();

dumpClass.toString( A, A.getClass(), list );

return A.getClass().getName().concat( list.toString() );

}

private static void toString( Object A, Class<?> class2, List<String> list ) {

Field F[] = class2.getDeclaredFields();

AccessibleObject.setAccessible( F, true );

for ( int i = 0; i < F.length; i++ ) {

try {

list.add( j[i].getName() + "=" + F[i].get(A) );

}

catch ( IllegalAccessException e ) { e.printStackTrace(); }

}

if ( class2.getSuperclass().getSuperclass() != null ) {

toString( A, class2.getSuperclass(), list );

}

}

}

public dumpClassTest {

String string = "abcde";

int number= 11;

double k = 12.34

public static void main(String ... args) {

System.out.println(dumpClass.toString(new dumpClassTest()));

// output : dumpClassTest[string=abcde, number=11, k = 12.34]

}

}

public class dumpClassTest222 extends dumpClassTest {

String string2="fghij";

int Jnum = 22;

double doub= Math.PI;

public static void main(String ... args) {

System.out.println(dumpClass.toString(new dumpClassTest2()));

// output : dumpClassTest222[string2=fghil, Jnum= 22, doub=3.1415926 , string=abcde, number=11, k = 12.34]

}

}

3, Write an Android app, it generates two random integers between 0 and 10. Then, asks the user to do addition, subtraction and multiplication operations. After the answers are entered, the user clicks “Submit Answers” button. The app displays 0 - 3 stars based on the number of correct answers. When “Reset Questions” button is clicked, new questions are generated. For the star image, you can use your own or any star image you can find online.

import android.support.v7.app.ActionBarActivity;

import android.support.v7.app.ActionBar;

import android.support.v4.app.Fragment;

import android.content.Context;

import android.os.Build;

import android.os.Bundle;

import android.view.Gravity;

import android.view.LayoutInflater;

import android.view.Menu;

import android.view.MenuItem;

import android.view.View;

import android.view.ViewGroup;

import android.widget.ArrayAdapter;

import android.widget.EditText;

import android.widget.TextView;

public class MainActivity extends ActionBarActivity implements

ActionBar.OnNavigationListener {

private static final String STATE\_RANDOM \_CALCULATOR = " random calculator";

public void onButtonClick(View v)

{

int n1,n2,sum, diff, prod;

TextView e1 = new TextView(this);

e1. setText(Math.random(10));

TextView e2 = new TextView(this);

e2. setText(Math.random(10));

EditText t1 = (EditText)findViewById(R.id.num1)

EditText t2 = (EditText)findViewById(R.id.num2)

EditText t3 = (EditText)findViewById(R.id.num3)

n1=Integer.parseInt(e1.getText().toString());

n2=Integer.parseInt(e2.getText().toString());

sum = n1 + n2;

diff = n1 – n2;

prod = n1 \* n2;

}

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);