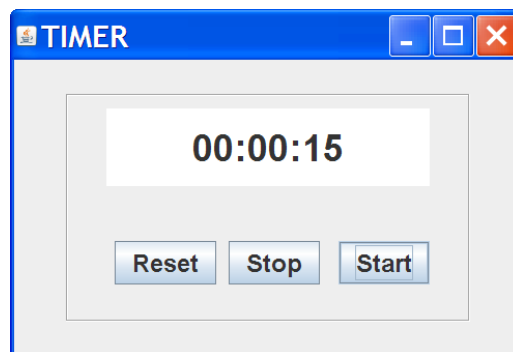


LAB

Thursday 8/21/2008

Design and implement the program that contains a timer. When the program starts, the timer shows “00:00:00.” When we click the Start button, the timer starts. When we click the Stop button, the timer pauses, showing the elapsed time. When we click the Start button again, the timer resumes. Clicking the Reset button resets the elapsed time to 00:00:00. Use NetBeans for design and implementation of this program.



```
/*
 * To change this template, choose Tools | Templates
 * and open the template in the editor.
 */

package my.Timer;

/**
 *
 * @author Taehyung
 */

public class Controller {
    private TimerUI ui;
    private Timer timer;

    public static enum State {RUN, STARTUP, MANUAL, RESET, OFF};
    private State state;

    public Controller (TimerUI ui, Timer timer) {
        this.ui = ui;
    }
}
```

```
        this.timer = timer;
        timer.setController (this);
        ui.setController(this);
        setStateOff();
    }

    public void setStateOn() {
        state = State.RUN;
        timer.start();
    }

    public void setStateOff() {
        state = State.OFF;
        timer.stop();
    }

    public void startupState() {
        timer.start();
    }

    public void reset() {
        ui.setRunTime(o);
        timer.reset();
    }

    public void updateClock (int seconds) {
        ui.setRunTime(seconds);
    }
}

/*
 * To change this template, choose Tools | Templates
 * and open the template in the editor.
 */

package my.Timer;

/**
 *
 * @author Taehyung
 */
public class Timer implements Runnable{
    private int secondsElapsed = 0;
```

```
private static final int clockUpdateInterval = 1000;
private boolean isRunning;
private Controller controller;

public void setController (Controller controller) {
    this.controller = controller;
}
public void run() {
    while (isRunning) {
        // update the timer and
        // sleep
        ....

    }
    ++secondsElapsed;
}

public void start() {
    isRunning = true;

    // create a clockTread and start it
    ....
}

public void stop() {
    isRunning = false;
}

public void reset(){
    //reset timer
    ....
    isRunning = false;
}
}

/*
 * TimerUI.java
 *
 * Created on August 16, 2008, 1:06 PM
 */

package my.Timer;
```

```
import java.text.DecimalFormat;
import java.awt.*;
import javax.swing.*;
/**
 *
 * @author Taehyung
 */
public class TimerUI extends javax.swing.JFrame {

    private Controller controller;

    /** Creates new form TimerUI */
    public TimerUI() {
        super("TIMER");
        initComponents();
    }

    /** This method is called from within the constructor to
     * initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is
     * always regenerated by the Form Editor.
     */
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        jPanel1 = new javax.swing.JPanel();
        jLabel1 = new javax.swing.JLabel();
        jButton1 = new javax.swing.JButton();
        jButton2 = new javax.swing.JButton();
        jButton3 = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

        jPanel1.setBorder(javax.swing.BorderFactory.createEtchedBorder());

        jLabel1.setBackground(new java.awt.Color(255, 255, 255));
        jLabel1.setFont(new java.awt.Font("Dialog", 1, 36));
        jLabel1.setHorizontalAlignment(javax.swing.SwingConstants.CENTER);
        jLabel1.setText("00:00:00");
        jLabel1.setOpaque(true);

        jButton1.setFont(new java.awt.Font("Dialog", 1, 24));
        jButton1.setText("Start");
```

```
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setFont(new java.awt.Font("Dialog", 1, 24));
        jButton2.setText("Stop");
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });

        jButton3.setFont(new java.awt.Font("Dialog", 1, 24));
        jButton3.setText("Reset");
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel1Layout = new
        javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(

        jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(37, 37, 37)

            .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                .addGroup(jPanel1Layout.createSequentialGroup()
                    .addComponent(jButton3)

            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(37, 37, 37)
                .addComponent(jButton2)
                .addGap(18, 18, 18)
                .addComponent(jButton1)
                .addComponent(jLabel1, javax.swing.GroupLayout.PREFERRED_SIZE,
312, javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(37, Short.MAX_VALUE))
```

```

    );
    jPanel1Layout.setVerticalGroup(

jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    G)
        .addGroup(jPanel1Layout.createSequentialGroup()
            .addContainerGap()
            .addComponent(jLabel1, javax.swing.GroupLayout.PREFERRED_SIZE,
75, javax.swing.GroupLayout.PREFERRED_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 53,
Short.MAX_VALUE)

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.BASELINE)
            .addComponent(jButton1)
            .addComponent(jButton2)
            .addComponent(jButton3))
            .addGap(34, 34, 34)
        );

    javax.swing.GroupLayout layout = new
javax.swing.GroupLayout(getContentPane());
    getContentPane().setLayout(layout);
    layout.setHorizontalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(layout.createSequentialGroup()
            .addGroup(layout.createParallelGroup()
                .addGap(50, 50, 50)
                .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addContainerGap(48, Short.MAX_VALUE))
            );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup()
                    .addGap(33, 33, 33)
                    .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addContainerGap(31, Short.MAX_VALUE))
                );

```

```

    pack();
} // </editor-fold>

public void setRunTime (int runTime){

    DecimalFormat formatter = new DecimalFormat ("00");
    jLabel1.setText(formatter.format(runTime / 3600) + ":"
        + formatter.format(runTime / 60) + ":"
        + formatter.format(runTime % 60));
}

private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {
    controller.setStateOn();
}

private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {
    controller.reset();
}

private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {
    controller.setStateOff();
}

public void setController (Controller controller) {
    this.controller = controller;
}

/**
 * @param args the command line arguments
 */
public static void main(String args[]) {
    java.awt.EventQueue.invokeLater(new Runnable() {
        public void run() {
            new TimerUI().setVisible(true);
        }
    });
}

// Variables declaration - do not modify
private javax.swing.JButton jButton1;
private javax.swing.JButton jButton2;
private javax.swing.JButton jButton3;
private javax.swing.JLabel jLabel1;

```

```
private javax.swing.JPanel jPanel1;  
// End of variables declaration  
  
}  
  
/*  
 * To change this template, choose Tools | Templates  
 * and open the template in the editor.  
 */  
  
package my.Timer;  
  
/**  
 *  
 * @author Taehyung  
 */  
public class Runner {  
    public static void main (String[] args) {  
        Timer timer = new Timer();  
        TimerUI ui = new TimerUI();  
        Controller controller = new Controller(ui, timer);  
        ui.setVisible(true);  
    }  
}
```