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Browser.java

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```

import javax.swing.event.*;
import javax.swing.*;
import java.awt.event.*;
import java.awt.BorderLayout;
import java.net.URL;

/**
 * Simple illustration of GUI construction for a rudimentary
 * web-browser.
 * <P>
 * Illustrates Layouts, Buttons, Menus, and simple GUI construction.
 * Exercises for the reader include making the buttons functional,
 * adding a Home button, and more. This can be done via extension
 * or by modifying the existing class.
 * <P>
 * When creating a browser, client code should set the size of
 * of the frame (note that Browser extends JFrame).
 * <P>
 * <PRE>
 *   Browser b = new Browser();
 *   b.setSize(400,400);
 *   b.setVisible(true);
 * </PRE>
 * @author Owen Astrachan
 */

public class Browser extends JFrame
{
    private JEditorPane myEditor;           // displays web page
    private JLabel      myNextURL;          // if link clicked, go here
    private JTextField  myURLDisplay;       // user-entered url
    private JButton     myBackButton;       // generates call of doBack()
    private JButton     myNextButton;       // generates call of doNext()

    /**
     * Construct the web browser, calling code should set size of frame.
     */
    public Browser()
    {
        myEditor = new JEditorPane();
        myEditor.setEditable(false); // allows links to be followed
        initGui();
    }

    private void makeMenu()
    {
        JMenu fileMenu = new JMenu("File");
        JMenuBar menubar = new JMenuBar();
        menubar.add(fileMenu);

        fileMenu.add(new AbstractAction("Quit")
        {
            public void actionPerformed(ActionEvent e) {
                System.exit(0);
            }
        });
        setJMenuBar(menubar);
    }

    private JPanel makeButtons()
    {
        myBackButton = new JButton("Back");
        myNextButton = new JButton("Next");

        // add listener so backButton calls doBack()
        myBackButton.addActionListener(new ActionListener(){

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        public void actionPerformed(ActionEvent e) {
            doBack();
        }
    }

    // add listener so nextButton calls doNext()
    myNextButton.addActionListener(new ActionListener(){
        public void actionPerformed(ActionEvent e) {
            doNext();
        }
    });

    // create panel with back at left, next at right, return it
    JPanel panel = new JPanel(new BorderLayout());
    panel.add(myBackButton, BorderLayout.WEST);
    panel.add(myNextButton, BorderLayout.EAST);
    return panel;
}

/**
 * called when back button pressed
 */
protected void doBack()
{
    JOptionPane.showMessageDialog(null, "you pressed the back button");
}

/**
 * called when next button pressed
 */
protected void doNext()
{
    JOptionPane.showMessageDialog(null, "you pressed the next button");
}

/**
 * Make user-entered URL/text field and back/next buttons
 */
private JPanel makeTopPanel()
{
    myURLDisplay = new JTextField(35);
    JLabel topLabel = new JLabel("url/address ");
    JPanel urlPanel = new JPanel(new BorderLayout());
    urlPanel.add(topLabel, BorderLayout.WEST);
    urlPanel.add(myURLDisplay, BorderLayout.CENTER);
    urlPanel.add(makeButtons(), BorderLayout.NORTH);

    // if user presses return, load/show the URL
    myURLDisplay.addActionListener(new ActionListener() {
        public void actionPerformed(ActionEvent e) {
            showPage(e.getActionCommand());
        }
    });

    return urlPanel;
}

/**
 * Make the panel where "would-be" clicked URL is displayed
 */
private JPanel makeBottomPanel()
{
    // bottomLabel is a hack. Because the myNextURL label
    // is initially empty it doesn't show up, the bottomLabel does

    myNextURL = new JLabel();
    JLabel bottomLabel = new JLabel("");
    JPanel bottomPanel = new JPanel(new BorderLayout());
    bottomPanel.add(bottomLabel, BorderLayout.WEST);

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        bottomPanel.add(myNextURL, BorderLayout.CENTER);
        return bottomPanel;
    }

    private void initGui()
    {
        JPanel topPanel = makeTopPanel();
        JPanel bottomPanel = makeBottomPanel();

        // make editor respond to link-clicks/mouse-overs, make it scroll
        myEditor.addHyperlinkListener(new LinkFollower());
        JScrollPane scroller = new JScrollPane(myEditor);

        // add components to frame, make it exit when closed
        // default for contentPane is BorderLayout, use this

        this.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        this.getContentPane().add(topPanel, BorderLayout.NORTH);
        this.getContentPane().add(scroller, BorderLayout.CENTER);
        this.getContentPane().add(bottomPanel, BorderLayout.SOUTH);

        makeMenu();
        setTitle("Duke/108 Wowser-Browser");
    }

    /**
     * displays the url the user enters and echo
     * the url in the textfield (even if it came from there!)
     * the echo makes it so link-clicking shows the URL
     */
    private void showPage(String url)
    {
        try {
            myEditor.setPage(url);
            myURLDisplay.setText(url);
        }
        catch (Exception e) {
            myEditor.setContentType("text/html");
            myEditor.setText("<html>Could not load "+url+"</html>");
        }
    }

    /**
     * Show where link would take us if clicked
     */
    private void showNextURL(String s)
    {
        myNextURL.setText(s);
    }

    /**
     * Inner class to deal with link-clicks and mouse-overs
     */
    private class LinkFollower implements HyperlinkListener
    {
        public void hyperlinkUpdate(HyperlinkEvent evt)
        {
            if (evt.getEventType() == HyperlinkEvent.EventType.ACTIVATED) {
                // user clicked a link, load it and show it
                try {
                    showPage(evt.getURL().toString());
                }
                catch (Exception e) {
                    String s = evt.getURL().toString();
                    JOptionPane.showMessageDialog(
                        Browser.this,
                        "loading problem for "+s+" "+e,

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        "Load Problem",
        JOptionPane.ERROR_MESSAGE);
    }
}

    else if (evt.getEventType() == HyperlinkEvent.EventType.ENTERED) {
        // user moused-into a link, show what would load

        try {
            showNextURL(evt.getURL().toString());
        }
        catch (Exception e) {
            // nothing to do, if URL fails, don't pre-announce
        }
    }
    else if (evt.getEventType() == HyperlinkEvent.EventType.EXITED) {
        // user moused-out of a link, erase what was shown
        showNextURL("");
    }
}

    }

    public static void main(String args[])
    {
        Browser b = new Browser();
        b.setSize(600,600);
        b.setLocation(10,20);
        b.setVisible(true);
    }
}

```