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/*-------------------------------------------------------------------------------------------------
 * Author:      Dan Cassidy
 * Date:        2015-07-13
 * Assignment:  HW3-4
 * Source File: NumberConverter.java
 * Language:    Java
 * Course:      CSCI-C 490, Android Programming, MoWe 08:00
 -------------------------------------------------------------------------------------------------*/
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.awt.BorderLayout;
import java.awt.FlowLayout;
import java.awt.GridLayout;

import javax.swing.JButton;
import javax.swing.JFrame;
import javax.swing.JLabel;
import javax.swing.JPanel;
import javax.swing.JTextField;

/**
 * Small GUI-based program to convert a base ten number into a base two number.
 *
 * @author Dan Cassidy
 */
public class NumberConverter extends JFrame implements ActionListener
{
    private JTextField textBaseTen;
    private JTextField textBaseTwo;

    /**
     * Entry point for the class.
     *
     * @param args Command line arguments. <i>Ignored</i>.
     */
    public static void main(String[] args)
    {
        NumberConverter gui = new NumberConverter();
        gui.setVisible(true);
    }

    /**
     * Default constructor. Handles the setup of all the GUI elements.
     */
    public NumberConverter()
    {
        super("Number Converter");
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setLayout(new BorderLayout());

        // Set up the labels and input text boxes.
        JPanel inputPanel = new JPanel();
        inputPanel.setLayout(new GridLayout(2, 2));

        JLabel labelBaseTen = new JLabel("Input a number in base ten: ");
        inputPanel.add(labelBaseTen);

        textBaseTen = new JTextField();
        inputPanel.add(textBaseTen);

```

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61          JLabel labelBaseTwo = new JLabel("Your number in base two: ");
62          inputPanel.add(labelBaseTwo);
63
64          textBaseTwo = new JTextField();
65          inputPanel.add(textBaseTwo);
66
67          add(inputPanel, BorderLayout.NORTH);
68
69          // Set up the buttons.
70          JPanel buttonsPanel = new JPanel();
71          buttonsPanel.setLayout(new FlowLayout());
72
73          JButton buttonConvert = new JButton("Convert");
74          buttonConvert.addActionListener(this);
75          buttonsPanel.add(buttonConvert);
76
77          JButton buttonClear = new JButton("Clear");
78          buttonClear.addActionListener(this);
79          buttonsPanel.add(buttonClear);
80
81          add(buttonsPanel, BorderLayout.SOUTH);
82
83          // Make the UI arrange itself.
84          pack();
85      }
86
87      /**
88       * Handles events generated by the buttons.
89       *
90       * @param e Specifies the generated event.
91       */
92      @Override
93      public void actionPerformed(ActionEvent e)
94      {
95          String buttonString = e.getActionCommand();
96
97          // Convert button was clicked.
98          if (buttonString.equals("Convert"))
99          {
100             try
101             {
102                 textBaseTwo.setText(convertToBaseTwo(textBaseTen.getText()));
103             }
104             catch (IllegalArgumentException ex)
105             {
106                 textBaseTen.setText("Error: Invalid number.");
107             }
108             catch (Exception ex)
109             {
110                 textBaseTen.setText(ex.getMessage());
111                 ex.printStackTrace();
112             }
113             textBaseTen.requestFocus();
114         }
115         // Clear button was clicked.
116         else if (buttonString.equals("Clear"))
117         {
118             textBaseTen.setText("");
119             textBaseTwo.setText("");
120             textBaseTen.requestFocus();
```

```
121          }
122          // Error.
123          else
124              System.out.println("Unexpected error.");
125      }
126
127      /**
128       * Converts a base ten number into a base two number.
129       *
130       * @param inputNumber Contains the number to be converted from base ten to base two.
131       * @return String, holding the number to be displayed.
132       * @throws NumberFormatException if <b>inputNumber</b> cannot be parsed into an integer.
133       * @throws IllegalArgumentException if <b>inputNumber</b> is negative.
134       */
135      private String convertToBaseTwo(String inputNumber)
136      {
137          String result = "";
138
139          // Try to parse the input string, then check if the number is good. If parsing fails or the
140          // number is bad, exceptions are thrown.
141          int number = Integer.parseInt(inputNumber);
142          if (number < 0)
143              throw new IllegalArgumentException();
144
145          // Handle the number.
146          if (number == 0)
147              result = "0";
148          else
149              while (number != 0)
150              {
151                  result = (number % 2) + result;
152                  number /= 2;
153              }
154
155          return result;
156      }
157
158  }
159
```