```java
/*************************************************************************
 * Kevin Funderburg
 * CS 3354 - Programming Assignment 4
 * GUI Calendar
 *
 * Contents of GUI.java
 *************************************************************************/

/**
 * I unfortunately could not dedicate the time I would normally do for this part of the project due
 * to some medical issues with my wife. She had a difficult surgery recently and between dedicating
 * time to her and work I just couldn't finish this one up like I would normally.
 * I figured it would be best to email you what I had to avoid any continuing late deductions.
 */

package com.funderburg;

import javax.swing.*;
import javax.swing.table.JTableHeader;
import java.awt.Dimension;
import java.awt.GridLayout;
import java.awt.event.MouseAdapter;
import java.awt.event.MouseEvent;
import java.text.ParseException;
import java.text.SimpleDateFormat;
import java.util.Calendar;
import java.util.Date;
import java.util.Locale;

public class GUI extends JPanel {
    private boolean DEBUG = false;
    public static String CALHEADER = "";
    public static String CALTITLE = "Calendar";

    public GUI() {
        super(new GridLayout(1,0));


        String[] columnNames = {"Sunday", "Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday"};

        Calendar cal = Calendar.getInstance();

        int year = 2018, month = 11, day = 19;

        int daysInMonth;

        // Get the number of days for the month
        if (month == 1 || month == 3 || month == 5 || month == 7 || month == 8 || month == 10 || month == 12) {
            daysInMonth = 31;
        } else if (month == 2) {
            daysInMonth = 28;
        } else {
            daysInMonth = 30;
        }

        // Get the day of the week for the first day of the month
        String firstDayString = month + "/" + "01" + "/" + year;
        int firstDayOfMonth = 0;

        SimpleDateFormat sdf = new SimpleDateFormat("MM/dd/yyyy", Locale.ENGLISH);
```

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61          Date myDate = null;
62          try {
63              myDate = sdf.parse(firstDayString);
64          } catch (ParseException e) {
65              e.printStackTrace();
66          }
67          sdf.applyPattern("EEE");
68          String sMyDate = sdf.format(myDate);
69          System.out.println(sMyDate);
70
71          switch (sMyDate) {
72              case "Sun":
73                  firstDayOfMonth = 0;
74                  break;
75              case "Mon":
76                  firstDayOfMonth = 1;
77                  break;
78              case "Tue":
79                  firstDayOfMonth = 2;
80                  break;
81              case "Wed":
82                  firstDayOfMonth = 3;
83                  break;
84              case "Thu":
85                  firstDayOfMonth = 4;
86                  break;
87              case "Fri":
88                  firstDayOfMonth = 5;
89                  break;
90              case "Sat":
91                  firstDayOfMonth = 6;
92                  break;
93          }
94
95          // Get header for calendar
96          switch (month) {
97              case 1:
98                  CALHEADER = "January";
99                  break;
100             case 2:
101                 CALHEADER = "February";
102                 break;
103             case 3:
104                 CALHEADER = "March";
105                 break;
106             case 4:
107                 CALHEADER = "April";
108                 break;
109             case 5:
110                 CALHEADER = "May";
111                 break;
112             case 6:
113                 CALHEADER = "June";
114                 break;
115             case 7:
116                 CALHEADER = "July";
117                 break;
118             case 8:
119                 CALHEADER = "August";
120                 break;
121             case 9:
122                 CALHEADER = "September";
```

```java
123                    break;
124                case 10:
125                    CALHEADER = "October";
126                    break;
127                case 11:
128                    CALHEADER = "November";
129                    break;
130                case 12:
131                    CALHEADER = "December";
132                    break;
133            }
134
135        // Create calendar data for the table to be shown
136        int x = 1, y = 0;
137        Object[][] data = new Object[6][7];
138
139        for (int i = 0; i < 6; i++) {
140            for (int j = 0; j < 7; j++) {
141                if (x <= daysInMonth && y >= firstDayOfMonth) {
142                    data[i][j] = x;
143                    x++;
144                } else {
145                    data[i][j] = "";
146                }
147                y++;
148            }
149        }
150
151        final JTable table = new JTable(data, columnNames);
152        table.setPreferredScrollableViewportSize(new Dimension(500, 250));
153        table.setFillsViewportHeight(true);
154
155        if (DEBUG) {
156            table.addMouseListener(new MouseAdapter() {
157                public void mouseClicked(MouseEvent e) {
158                    printDebugData(table);
159                }
160            });
161        }
162
163        //Create the scroll pane and add the table to it.
164        JScrollPane scrollPane = new JScrollPane(table);
165
166        //Add the scroll pane to this panel.
167        add(scrollPane);
168
169        // ASKPROF:  Best method to add a header to the table (refer to https://docs.oracle.com/
    javase/tutorial/uiswing/components/table.html#show)
170        //          (Have a title with the calendar along a header above the default header of the
    DOW)
171        // ASKPROF:  Incorporation of hash map to to contain memo data, maybe an array?
172        // ASKPROF:  How to add a text area below or next to the table
173        // ASKPROF:  Use of external calendar libraries: how to do that? Is that better than
    manually creating?
174    }
175
176    private void printDebugData(JTable table) {
177        int numRows = table.getRowCount();
178        int numCols = table.getColumnCount();
179        javax.swing.table.TableModel model = table.getModel();
180
181        System.out.println("Value of data: ");
```

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182            for (int i=0; i < numRows; i++) {
183                System.out.print("    row " + i + ":");
184                for (int j=0; j < numCols; j++) {
185                    System.out.print("  " + model.getValueAt(i, j));
186                }
187                System.out.println();
188            }
189            System.out.println("-------------------------");
190        }
191
192        /**
193         * Create the GUI and show it.  For thread safety,
194         * this method should be invoked from the
195         * event-dispatching thread.
196         */
197        private static void createAndShowGUI() {
198            //Create and set up the window.
199            JFrame frame = new JFrame(CALTITLE);
200            frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
201
202            //Create and set up the content pane.
203            GUI newContentPane = new GUI();
204            newContentPane.setOpaque(true); //content panes must be opaque
205            frame.setContentPane(newContentPane);
206
207            //Display the window.
208            frame.pack();
209            frame.setVisible(true);
210        }
211
212        public static void main(String[] args) {
213            //Schedule a job for the event-dispatching thread:
214            //creating and showing this application's GUI.
215            javax.swing.SwingUtilities.invokeLater(new Runnable() {
216                public void run() {
217                    createAndShowGUI();
218                }
219            });
220        }
221 }
222
```