Calendar Implementation

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Title: Java Calendar Java Project

Abstract

The aim of this project was to develop a calendar application using java programming language. The application enables users to view, add, and edit events and appointments, as well as set reminders for upcoming events. The project utilises Java′s built in libraries for date and time, and employs the Model View Controller(MVC) design pattern to ensure the application is maintainable and scalable.

Introduction

The calendar application is a widely used tool in today′s world,Whether for personal or professional purposes. With the advancement of technology, the traditional paper- based calendar has been replaced by digital ones. Java is a popular programming language that provides a rich set of libraries for a date and time manipulation making it an ideal choice for developing a calendar application.

Design

The project was designed using the MVC pattern, which separates the application into three distinct components : Model, View and Controller. The Model component encapsulates the data and logic of the application, the View component is responsible for displaying the data to the user , and the controller component acts as the intermediatory between Model and View accordingly.

Implementation

The application was implemented in Java, utilizing the Java Swing library for the graphical user interface. The model component was implemented using Java′s built in date and time libraries, while the Controller Component was implemented using event listeners. The View Component was implemented using various Swing Components, such as JTable, JDialog, and Jlabel.

Result

The calendar application was successfully developed and tested, meting all of the project requirements. The application allows users to view,add and edit events and appointments as well as set reminders for upcoming events. The MVC design pattern ensured that the application was maintainable and scalable and the use of Java′s built in libraries reduce the amount of custom code needed .

```
import javax.swing.*;
import javax.swing.event.*;
import javax.swing.table.*;
import java.awt.*;
import java.awt.event.*;
import java.util.*;

public class CalendarProgram{
    static JLabel lblMonth, lblYear;
    static JButton btnPrev, btnNext;
    static JTable tblCalendar;
    static JComboBox cmbYear;
    static JFrame frmMain;
    static Container pane;
    static DefaultTableModel mtblCalendar; //Table model
    static JScrollPane stblCalendar; //The scrollpane
    static JPanel pnlCalendar;
    static int realYear, realMonth, realDay, currentYear, currentMonth;
    public static void main (String args[]){
        //Look and feel
        try {UIManager.setLookAndFeel(UIManager.getSystemLookAndFeelClassName());}
        catch (ClassNotFoundException e) {}
        catch (InstantiationException e) {}
        catch (IllegalAccessException e) {}
        catch (UnsupportedLookAndFeelException e) {}

        //Prepare frame
        frmMain = new JFrame ("Gestionnaire de clients"); //Create frame
        frmMain.setSize(330, 375); //Set size to 400x400 pixels
        pane = frmMain.getContentPane(); //Get content pane
        pane.setLayout(null); //Apply null layout
        frmMain.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE); //Close when X is clicked
        //Create controls
        lblMonth = new JLabel ("January");
        lblYear = new JLabel ("Change year:");
        cmbYear = new JComboBox();
        btnPrev = new JButton ("&lt;&lt;");
        btnNext = new JButton ("&gt;&gt;");
        mtblCalendar = new DefaultTableModel(){public
boolean isCellEditable(int rowIndex, int
mColIndex){return false;}};
        tblCalendar = new JTable(mtblCalendar);
        stblCalendar = new JScrollPane(tblCalendar);
        pnlCalendar = new JPanel(null);

        //Set border

pnlCalendar.setBorder(BorderFactory.createTitledBord
er("Calendar"));

        //Register action listeners
        btnPrev.addActionListener(new btnPrev_Action());
        btnNext.addActionListener(new btnNext_Action());
        cmbYear.addActionListener(new
cmbYear_Action());

        //Add controls to pane
        pane.add(pnlCalendar);
        pnlCalendar.add(lblMonth);
        pnlCalendar.add(lblYear);
        pnlCalendar.add(cmbYear);
        pnlCalendar.add(btnPrev);
        pnlCalendar.add(btnNext);
        pnlCalendar.add(stblCalendar);

        //Set bounds
        pnlCalendar.setBounds(0, 0, 320, 335);
        lblMonth.setBounds(160-
lblMonth.getPreferredSize().width/2, 25, 100, 25);
        lblYear.setBounds(10, 305, 80, 20);
        cmbYear.setBounds(230, 305, 80, 20);
        btnPrev.setBounds(10, 25, 50, 25);
        btnNext.setBounds(260, 25, 50, 25);
        stblCalendar.setBounds(10, 50, 300, 250);
        //Make frame visible
        frmMain.setResizable(false);
        frmMain.setVisible(true);

        //Get real month/year
        GregorianCalendar cal = new GregorianCalendar(); //Create calendar
        realDay = cal.get(GregorianCalendar.DAY_OF_MONTH); //Get day
        realMonth = cal.get(GregorianCalendar.MONTH); //Get month
        realYear = cal.get(GregorianCalendar.YEAR); //Get year
        currentMonth = realMonth; //Match month and year
        currentYear = realYear;

        //Add headers
        String[] headers = {"Sun", "Mon", "Tue", "Wed", "Thu", "Fri", "Sat"}; //All headers
        for (int i=0; i<7; i++){
            mtblCalendar.addColumn(headers[i]);
        }


tblCalendar.getParent().setBackground(tblCalendar.get
Background()); //Set background

        //No resize/reorder

tblCalendar.getTableHeader().setResizingAllowed(false)
;

tblCalendar.getTableHeader().setReorderingAllowed(fal
se);

        //Single cell selection
        tblCalendar.setColumnSelectionAllowed(true);
        tblCalendar.setRowSelectionAllowed(true);

tblCalendar.setSelectionMode(ListSelectionModel.SING
LE_SELECTION);
```

```
        //Set row/column count
        tblCalendar.setRowHeight(38);
        mtblCalendar.setColumnCount(7);
        mtblCalendar.setRowCount(6);

        //Populate table
        for (int i=realYear-100; i<=realYear+100; i++){
            cmbYear.addItem(String.valueOf(i));
        }

        //Refresh calendar
        refreshCalendar (realMonth, realYear); //Refresh
calendar
    }

    public static void refreshCalendar(int month, int
year){
        //Variables
        String[] months =  {"January", "February",
"March", "April", "May", "June", "July", "August",
"September", "October", "November", "December"};
```

```
    int nod, som; //Number Of Days, Start Of Month


    //Allow/disallow buttons
    btnPrev.setEnabled(true);
    btnNext.setEnabled(true);
    if (month == 0 && year <= realYear-
10){btnPrev.setEnabled(false);} //Too early
    if (month == 11 && year >=
realYear+100){btnNext.setEnabled(false);} //Too late
    lblMonth.setText(months[month]); //Refresh the
month label (at the top)
    lblMonth.setBounds(160-
lblMonth.getPreferredSize().width/2, 25, 180, 25);
//Re-align label with calendar
    cmbYear.setSelectedItem(String.valueOf(year));
//Select the correct year in the combo box


    //Clear table
    for (int i=0; i<6; i++){
      for (int j=0; j<7; j++){
        mtblCalendar.setValueAt(null, i, j);
      }
```

```
        }

        //Get first day of month and number of days
        GregorianCalendar cal = new
GregorianCalendar(year, month, 1);
        nod =
cal.getActualMaximum(GregorianCalendar.DAY_OF_M
ONTH);
        som = cal.get(GregorianCalendar.DAY_OF_WEEK);

        //Draw calendar
        for (int i=1; i<=nod; i++){
            int row = new Integer((i+som-2)/7);
            int column  =  (i+som-2)%7;
            mtblCalendar.setValueAt(i, row, column);
        }

        //Apply renderers

tblCalendar.setDefaultRenderer(tblCalendar.getColumn
Class(0), new tblCalendarRenderer());
```

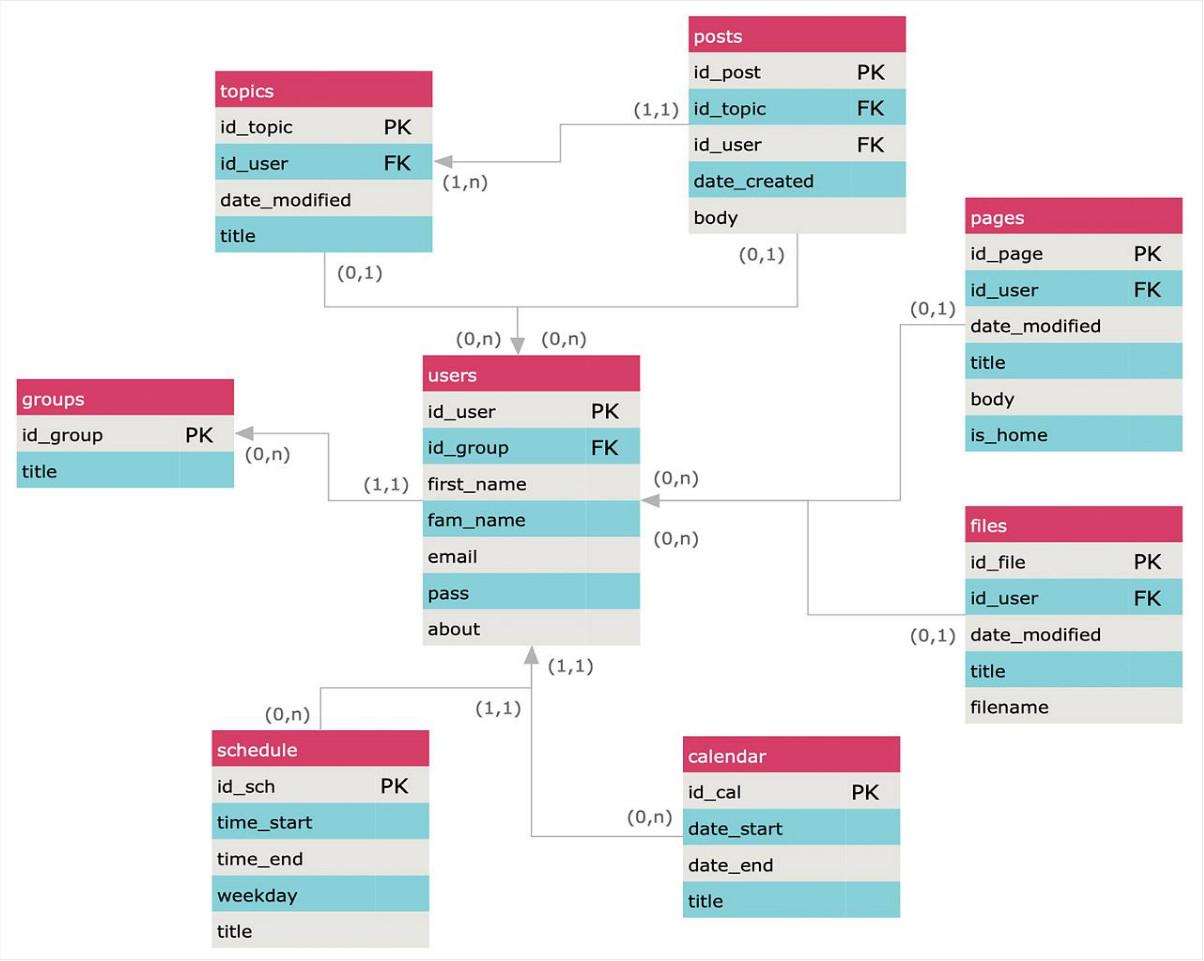
```
    }

    static class tblCalendarRenderer extends
DefaultTableCellRenderer{
        public Component
getTableCellRendererComponent (JTable table, Object
value, boolean selected, boolean focused, int row, int
column){
            super.getTableCellRendererComponent(table,
value, selected, focused, row, column);
            if (column == 0 || column == 6){ //Week-end
                setBackground(new Color(255, 220, 220));
            }
            else{ //Week
                setBackground(new Color(255, 255, 255));
            }
            if (value != null){
                if (Integer.parseInt(value.toString()) == realDay
&& currentMonth == realMonth && currentYear ==
realYear){ //Today
                    setBackground(new Color(220, 220, 255));
                }
            }
            setBorder(null);
            setForeground(Color.black);
            return this;
        }
    }

    static class btnPrev_Action implements
ActionListener{
        public void actionPerformed (ActionEvent e){
            if (currentMonth == 0){ //Back one year
                currentMonth = 11;
                currentYear -= 1;
            }
            else{ //Back one month
                currentMonth -= 1;
            }
            refreshCalendar(currentMonth, currentYear);
        }
    }
```

```
   static class btnNext_Action implements
ActionListener{
      public void actionPerformed (ActionEvent e){
         if (currentMonth == 11){ //Foward one year
            currentMonth = 0;
            currentYear += 1;
         }
         else{ //Foward one month
            currentMonth += 1;
         }
         refreshCalendar(currentMonth, currentYear);
      }
   }
   static class cmbYear_Action implements
ActionListener{
      public void actionPerformed (ActionEvent e){
         if (cmbYear.getSelectedItem() != null){
            String b =
cmbYear.getSelectedItem().toString();
            currentYear = Integer.parseInt(b);
            refreshCalendar(currentMonth, currentYear);
            }
        }
    }
}
```

ER Diagram for Calendar Implementation



topics	
id_topic	PK
id_user	FK
date_modified	
title	

posts	
id_post	PK
id_topic	FK
id_user	FK
date_created	
body	

pages	
id_page	PK
id_user	FK
date_modified	
title	
body	
is_home	

groups	
id_group	PK
title	

users	
id_user	PK
id_group	FK
first_name	
fam_name	
email	
pass	
about	

files	
id_file	PK
id_user	FK
date_modified	
title	
filename	

schedule	
id_sch	PK
time_start	
time_end	
weekday	
title	

calendar	
id_cal	PK
date_start	
date_end	
title	