**Topics**

Java beans

**Description**

In this assignment, you will enhance the last exercise to provide three buttons in the applcation frame. The buttons will be labeled �Calc Using Left�, �Calc Using Right� and �Clear All�. Each of these buttons will provide additional function as described below.

**Calc Using Left**

The user will enter two numbers and select an operation in the left calculator. User will also select an operation in the right calculator but will not enter any numbers in that calculator. Then the user will click the frame�s button �Calc Using Left�. The program will use the numbers from the left calculator and perform both the selected operations on them. Then, in each calculator, it will display the numbers (taken from the left calculator), the selected operation and the corresponding result.

**Calc Using Right**

This button will work similar to the button �Calc Using Left� except that in this case the program will use numbers from the rigth calculator instead of the left calculator as described below.

The user will enter two numbers and select an operation in the right calculator. User will also select an operation in the left calculator but will not enter any numbers in that calculator. Then the user will click the frame�s button �Calc Using Right�. The program will use the numbers from the right calculator and perform both the selected operations on them. Then, in each calculator, it will display the numbers (taken from the right calculator), the selected operation and the corresponding result.

**Clear All**

This button clear all text fields in both the calculators.

**Design**

For providing the above mentioned functionality, you will need to enhance the design of both the calculator bean (component) and the application frame.

**IMPLEMENTATION**

**Calculator Bean Implementation**

The frame will need to get and set several calculator bean values. The calculator bean will provide a set of properties and get/set methods for accessing these properties.� The frame will interact with the bean by calling its get/set property methods.

(From the frame, do not access the values of a bean�s text fields directly. Instead, use the bean�s get/set methods to interface with the bean).

**Bean Properties**

The calculator bean will provide the properties listed below:

�••••••• double num1 � This property represents the value of the first text field as a double. It has the corresponding get and set methods.

�••••••• double num2 � This property represents the value of the second text field as a double. It has the corresponding get and set methods.

�••••••• double result � This property represents the value of the third text field as a double. It has the corresponding get and the set methods. The get method does nothing.

�••••••• String operation � This property represents value of the operation selected through the group of radio buttons as a String. Its possible values are �Add�, �Subtract�, �Multiply�, and �Divide�. It has the corresponding get and set methods. The set method does nothing.

�••••••• boolean clear � This property is used for clearing all the bean�s text fields. It has the corresponding get/set method. The get method does nothing. The set method is used for clearing all the text fields. If the value true is passed to the set method, it clears all of the text fields. Otherwise, it does nothing.

**Bean Get/Set Methods**

�The headers for the get and set methods corresponding to the above properties are listed below:

�••••••• double getNum1()

�••••••• void setNum1(double n)

�••••••• double getNum2()

�••••••• void setNum2(double n)

�••••••• double getResult()

�••••••• void setResult(double n)

�••••••• String getOperation()

�••••••• void setOperation(String s)

�••••••• boolean getClear ( )

�••••••• void setClear(boolean b)

**Calculator Frame Implementation**

Create an application containing an extended JFrame.

Set extended frame�s layout to be BorderLayout.

Drop two panels in the frame. One in the Center and the other in the South.

Set the layout of the center panel to be GridLayout with 2 columns and 1 row.

Set the layout of the south panel to be FlowLayout.

Drop two instances of Calculator Bean in the center panel.

Drop three buttons labeled �Calc Using Left�, �Calc Using Right� and �Clear All� in the south panel. (See Pictures section below).

Implement the functions of each of the three buttons.

**Dropping A User Created Java Bean**

For dropping a User Created Java Bean, do the following:

[Make sure that the User Created Java Bean is already compiled (i.e. its class file exists).

It the class file does not exist, the drop mechanism will not work correctly.]

Select Design tab.

In design mode, select the unlabeled menu (Bean Chooser) in the top left corner, a menu will drop down.

Select the �select� item in the drop down button.

It will show Chooser dialog box.

From the Chooser dialog box, select the desired java bean class.

Drop the java bean in the desired location.

**Testing**

**Testing Calc Using Left**

Enter a number (say 8.0) in Num1 text field of the left calculator.

Enter a second number (say 2.0) in Num2 text field of the left calculator.

Select an operation (say Add) by clicking the appropriate radio button in the left calculator.

Select an operation (say Mult) by clicking the appropriate radio button in the right calculator.

Leave text fields of the right calculator untouched.

Click the �Calc Using Left� button in the frame.

The result of the selected operation (say Add) will show in the Res text field of the left calculator.

The two numbers entered in the left calculator will also show in the right calculator.

The result of the selected operation (say Mult) will show in the Res text field of the right calculator.

**Testing ClearAll**

Click the ClearAll button in the frame. All the text fields in both the calculators will clear.

**Testing Calc Using Right**

Enter a number (say 8.0) in Num1 text field of the right calculator.

Enter a second number (say 2.0) in Num2 text field of the right calculator.

Select an operation (say Add) by clicking the appropriate radio button in the right calculator.

Select an operation (say Mult) by clicking the appropriate radio button in the left calculator.

Leave text fields of the left calculator untouched.

Click the �Calc Using Right� button in the frame.

The result of the selected operation (say Add) will show in the Res text field of the right calculator.

The two numbers entered in the right calculator will also show in the left calculator.

The result of the selected operation (say Mult) will show in the Res text field of the left calculator.

**Pictures**

**Calculator Bean Picture**



**Calculator Application Frame Picture**

