

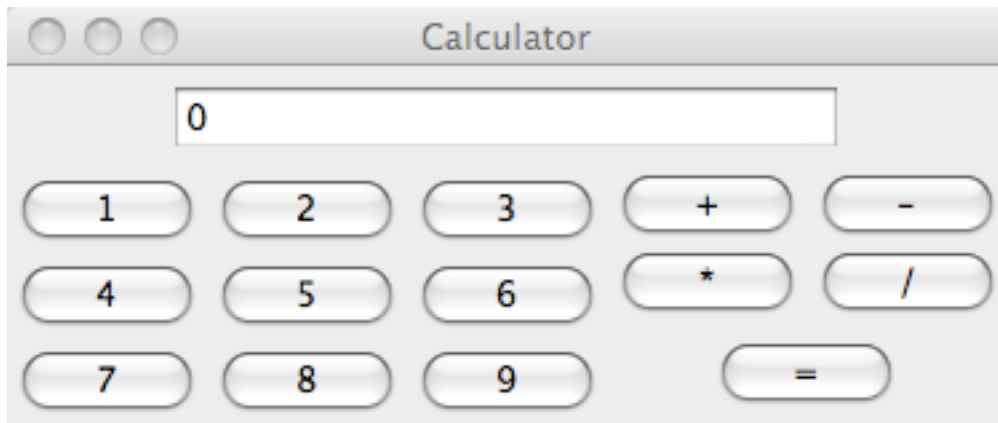
ITEC 120 Lab 13

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You will need to turn in a lab report for this lab.

Problem 1: New Operating Systems Inc.

You are working for New Operating Systems Inc. and they are about to release a revolutionary system for mobile phones. The operating system supports java and they need several utilities written for it before they release it. In order to provide utilities with the new operating system, they want a calculator that looks like this to include with the operating system:



Part 1: Making the GUI

In order to create the previous GUI, you will need several JPanels. There will be one main panel that holds three content panels: one for the text input, one for the numbers, and one for the operations.

The main panel should be added to a JFrame and the sub-panels are arranged by a BorderLayout in the main panel. The text input panel is in the northern portion of the BorderLayout. The numbers panel is in the west area of the BorderLayout. The operations panel is stored in the east area of the BorderLayout.

The text input panel contains a JTextField object of length 40. It does not need a layout manager. The numbers panel has a grid layout (3 rows, 3 columns), and contains 9 JButton objects representing the numbers 1-9 (using an array is recommended). The operations panel uses a BorderLayout and contains two sub-panels. The first is an operations panel that uses a grid layout (2 rows, 2 columns) and contains 4 JButton objects (that represent the +, -, *, and / keys). The last is a panel that contains the = key as a JButton. The operations panel is located in the northern portion of its parent, while the panel containing the equals key is located at the southern portion of its parent's layout.

Create the GUI and make sure it looks like the previous picture. The GUI will not work, but it should appear properly at this stage. Hint: if you create a class that does not contain the main method, but does contain JButtons, JFrames, and JTextFields it will be easier to make it interactive.

Part 2: Making the GUI interactive

Modify a class to implement the ActionListener interface. Call the addActionListener method on each JButton in your program and pass it the object that implements the ActionListener interface. If the class that implements the ActionListener interface is the class that contains the JButtons, use the word `this` instead of a variable name. By making the association, when buttons are pressed, they contact the GUI class via the actionPerformed method.

By default the textfield should hold a 0.

Whenever a number is pressed, if the number in the textfield is 0 then replace the 0 with the number on the JButton. If the number in the textfield is not 0, then multiply it by 10, add the result to the number on the button is pressed, and then update the textfield with the result.

Whenever an operation is pressed (+, -, /, or *) save the number in the textfield and the operation pressed in fields (class variables), and place 0 in the textfield.

Whenever the = key is pressed, use the previously stored number and operation to perform the following mathematical statement: `previousNumber <mathOperation> currentNumberInTextField`. Place the result of the operation in the textfield.

Lastly, test your program to make sure it calculates answers properly. The solution for this lab is 143 lines of code, feel free to use more or less code in your solution.