My Project Development Paper

CSC 414 Software Design

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11/11/2020

Introduction

1.1 identification

My project is a simple Calculator software for users who are on computers, phones, and laptops. Its David Lamb's Calculator, and it is version number one. This version was built 11/8/2020. This simple calculator is an application for use on computers, phones, and laptops. It is inexpensive and is easy to code and produce for many users. It is for people to do quick calculations at their comfort. It performs basic operation of arithmetic.

1.2 System Overview

The main purpose is to develop a simple calculator using java that does the following. It does arithmetic operation. The operations it performs is Addition, Subtraction, Multiplication, Division, Clearing the content of the display, and Changes a number to either positive or negative. It also has off button to close calculator app.

1.3 Document Overview

This paper will display the requirements, design, testing of the software. Also, the references that helped to understand the foundation of the software.

References

The references covered for this software was a blog "Learn To Create A Basic Calculator In Java Using Netbeans" and the URL is https://blog.eduonix.com/java-programming-2/learn-create-basic-calculator-java-using-netbeans/

The java docs website at https://docs.oracle.com/javase/7/docs/api/

Both of these References was really helpful and benefitable.

Requirements 3.0

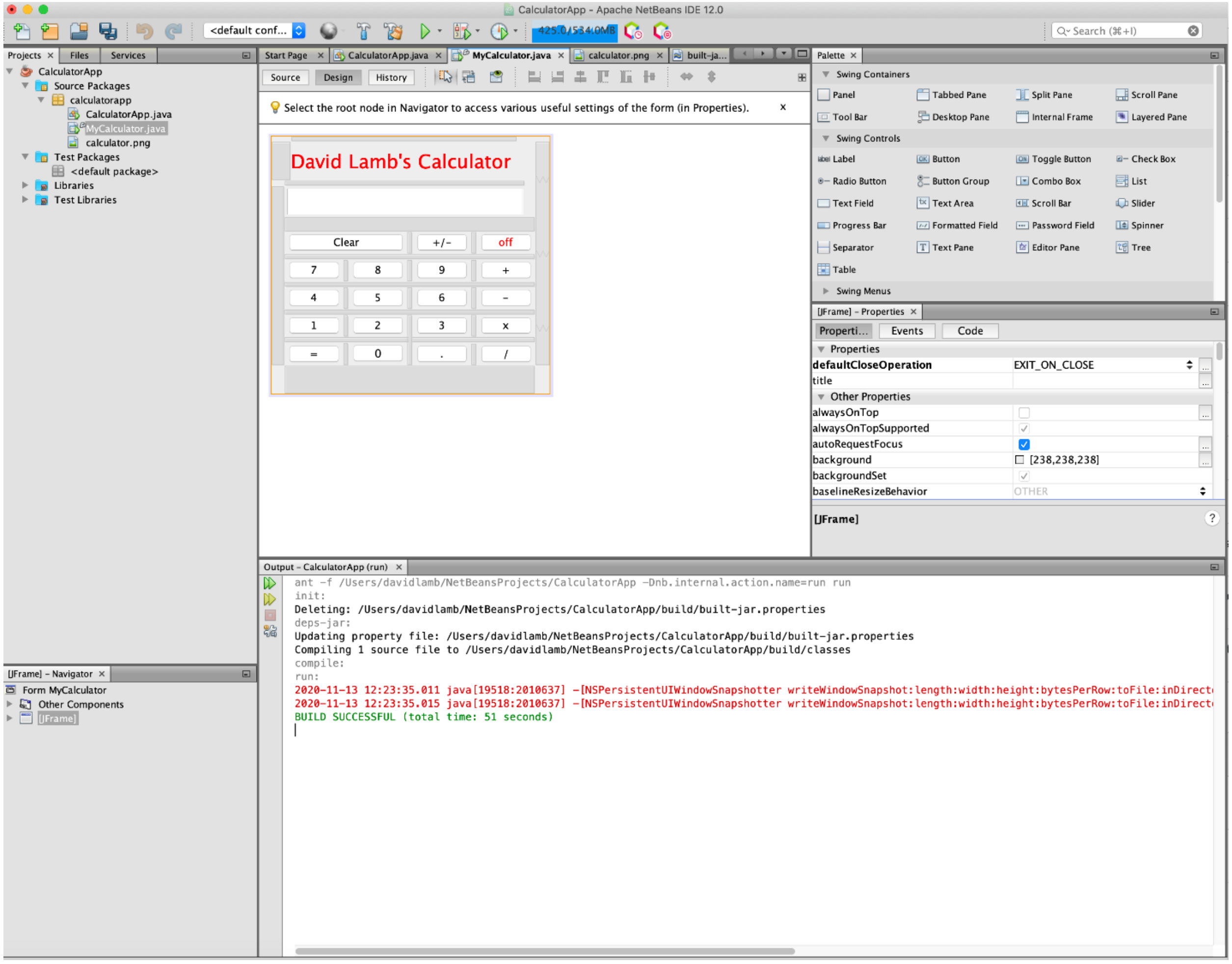
- It shell have an interface.
  - It will be used for users to enter input via buttons.
  - It will display output on textbox (screen).
- It shell have a decimal button.
  - This allows user to input and calculate decimal numbers.
- It shell have a +/- button.
  - This changes number to positive or negative.
- It shell have an off button.
  - This exits out of App.
- It shell have a clear button.
  - This will clear display and begin next calculation.
- It shell to simple math by +, -, *, /, buttons.
  - The user inputs the first number than the user pushes the desired operation button, and then the user receives input when pushing the equal button. The output is displayed on screen.
- It shell validate second number when doing division and display error message if second number is zero.

4.0 Design

4.1 Project Interface

I installed Java and the Netbeans IDE. I choose java for this app because it is a multiplatform langue. It has a virtual machine so it can cross over to many different machines. So, by using java the app is versatile. First, the interface is created by the swing library and its jfame tool. There will be a display (text box), and buttons for 0-9. In addition, a clear button, off button, equal button, and a button that inserts a decimal point. Finally, there is an equals button that performs calculations and has them displayed.

This is the app being built in Netbeans jfame design mode. The buttons in the requirements are all placed on interface. This answers also answers the interface requirement as well.



Select the root node in Navigator to access various useful settings of the form (in Properties).

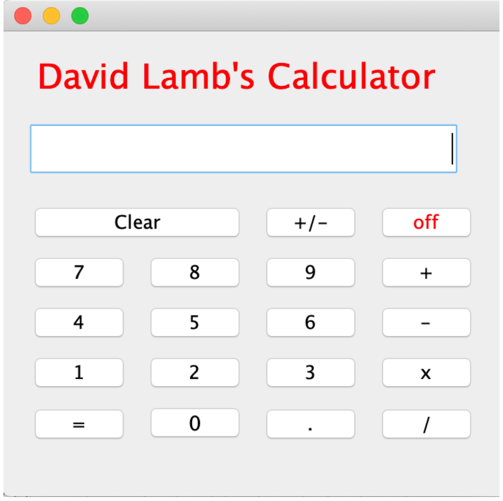
Properties	
defaultCloseOperation	EXIT_ON_CLOSE
title	
Other Properties	
alwaysOnTop	□
alwaysOnTopSupported	✓
autoRequestFocus	☑
background	□ [238,238,238]
backgroundSet	✓
baselineResizeBehavior	OTHER

[JFrame]

Output - CalculatorApp (run)

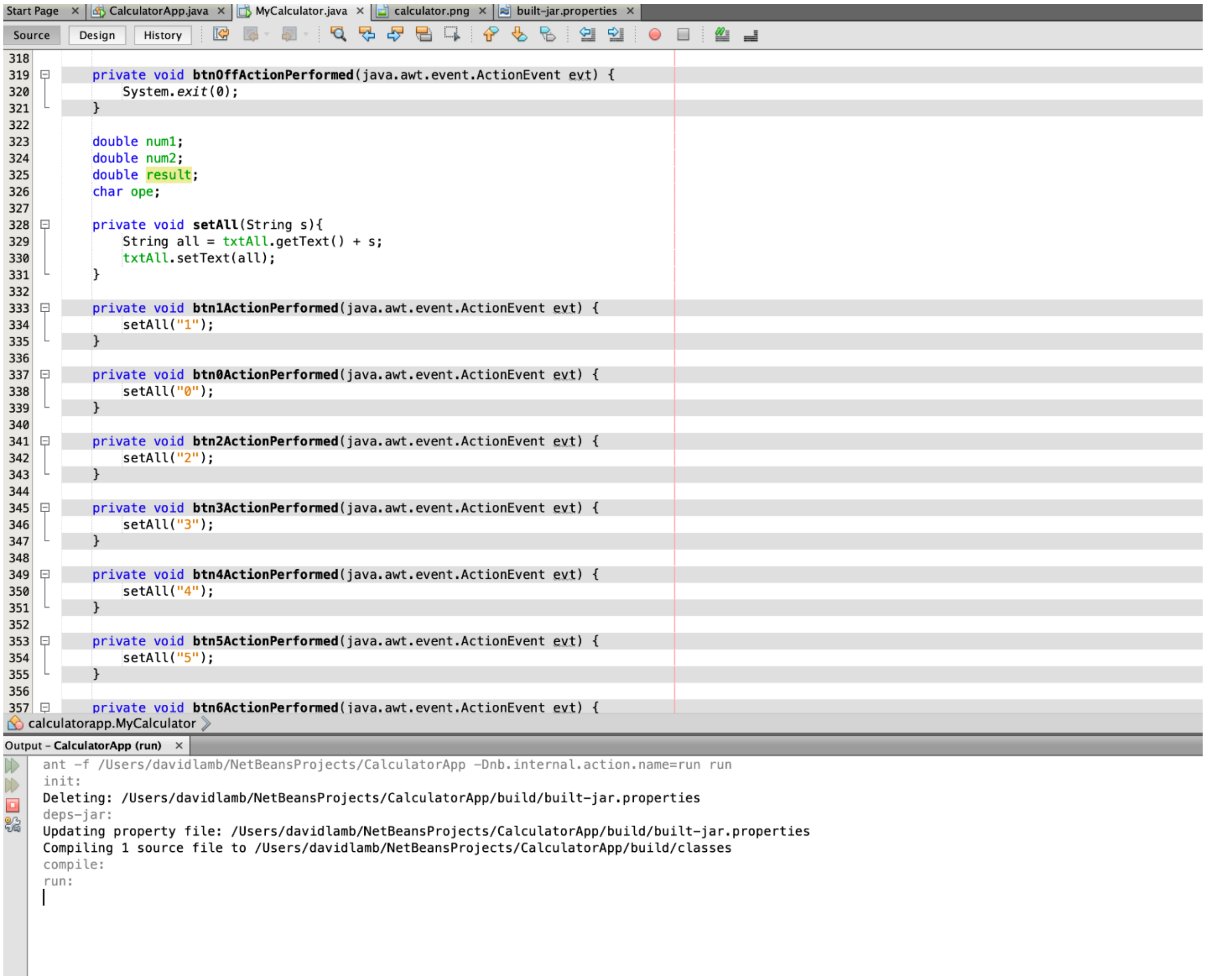
```
ant -f /Users/davidlamb/NetBeansProjects/CalculatorApp -Dnb.internal.action.name=run run
init:
Deleting: /Users/davidlamb/NetBeansProjects/CalculatorApp/build/built-jar.properties
deps-jar:
Updating property file: /Users/davidlamb/NetBeansProjects/CalculatorApp/build/built-jar.properties
Compiling 1 source file to /Users/davidlamb/NetBeansProjects/CalculatorApp/build/classes
compile:
run:
2020-11-13 12:23:35.011 java[19518:2010637] -[NSPersistentUIWindowSnapshotter writeWindowSnapshot:length:width:height:bytesPerRow:toFile:inDirect
2020-11-13 12:23:35.015 java[19518:2010637] -[NSPersistentUIWindowSnapshotter writeWindowSnapshot:length:width:height:bytesPerRow:toFile:inDirect
BUILD SUCCESSFUL (total time: 51 seconds)
```

This is the app when it is running.



4.2 Project internal design

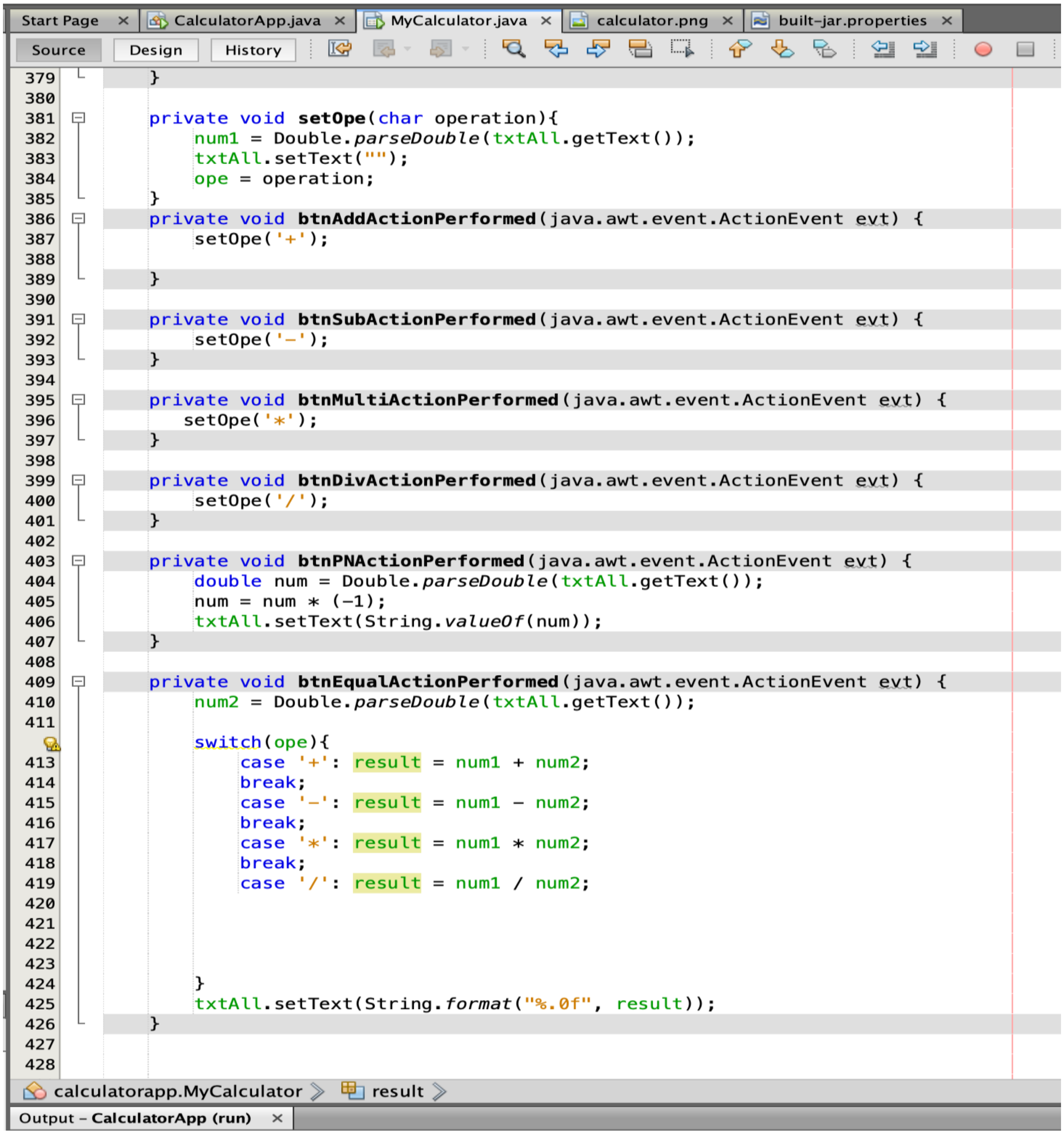
There will be a function (setAll(String)) that will take in a string and be used in other button functions (ActionPreform()) to display the char (‘1’, ‘2’, …) on screen. There will also be an operation function that will determine the operation.



```

    private void btnOffActionPerformed(java.awt.event.ActionEvent evt) {
        System.exit(0);
    }

    double num1;
    double num2;
    double result;
    char ope;

    private void setAll(String s){
        String all = txtAll.getText() + s;
        txtAll.setText(all);
    }

    private void btn1ActionPerformed(java.awt.event.ActionEvent evt) {
        setAll("1");
    }

    private void btn0ActionPerformed(java.awt.event.ActionEvent evt) {
        setAll("0");
    }

    private void btn2ActionPerformed(java.awt.event.ActionEvent evt) {
        setAll("2");
    }

    private void btn3ActionPerformed(java.awt.event.ActionEvent evt) {
        setAll("3");
    }

    private void btn4ActionPerformed(java.awt.event.ActionEvent evt) {
        setAll("4");
    }

    private void btn5ActionPerformed(java.awt.event.ActionEvent evt) {
        setAll("5");
    }

    private void btn6ActionPerformed(java.awt.event.ActionEvent evt) {
```

```
ant -f /Users/davidlamb/NetBeansProjects/CalculatorApp -Dnb.internal.action.name=run run
init:
Deleting: /Users/davidlamb/NetBeansProjects/CalculatorApp/build/built-jar.properties
deps-jar:
Updating property file: /Users/davidlamb/NetBeansProjects/CalculatorApp/build/built-jar.properties
Compiling 1 source file to /Users/davidlamb/NetBeansProjects/CalculatorApp/build/classes
compile:
run:
```

The switch will do appropriate operations on the variables (doubles) num1, num2 and then store the value in result and display it on the screen of calculator.



```
    }

    private void setOpe(char operation){
        num1 = Double.parseDouble(txtAll.getText());
        txtAll.setText("");
        ope = operation;
    }
    private void btnAddActionPerformed(java.awt.event.ActionEvent evt) {
        setOpe('+');

    }

    private void btnSubActionPerformed(java.awt.event.ActionEvent evt) {
        setOpe('-');
    }

    private void btnMultiActionPerformed(java.awt.event.ActionEvent evt) {
       setOpe('*');
    }

    private void btnDivActionPerformed(java.awt.event.ActionEvent evt) {
        setOpe('/');
    }

    private void btnPNActionPerformed(java.awt.event.ActionEvent evt) {
        double num = Double.parseDouble(txtAll.getText());
        num = num * (-1);
        txtAll.setText(String.valueOf(num));
    }

    private void btnEqualActionPerformed(java.awt.event.ActionEvent evt) {
        num2 = Double.parseDouble(txtAll.getText());

        switch(ope){
            case '+': result = num1 + num2;
            break;
            case '-': result = num1 - num2;
            break;
            case '*': result = num1 * num2;
            break;
            case '/': result = num1 / num2;




        }
        txtAll.setText(String.format("%.0f", result));
    }
```

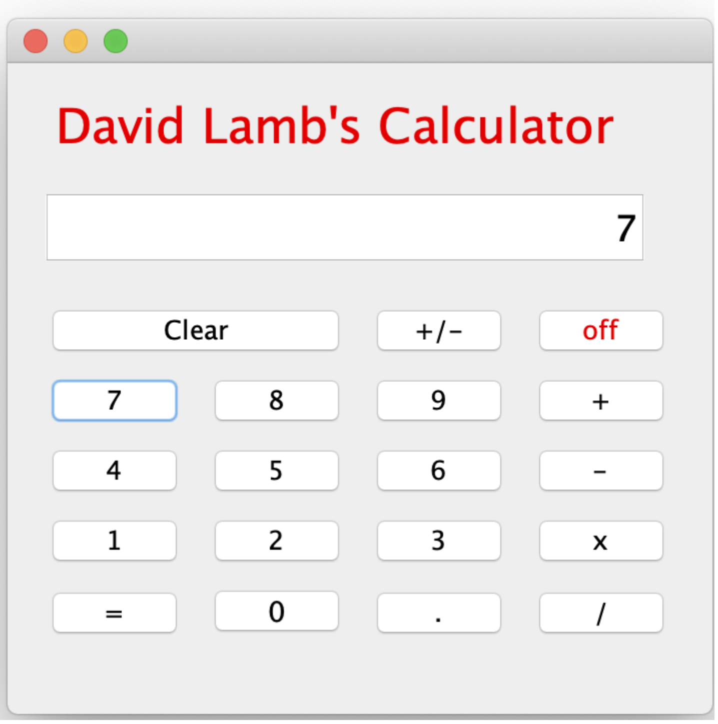
Testing Plan 5.0

The Testing Plan is to confirm the proper behavior of each button and their operations. The procedure is to give screen shots of data sets and their operations. Then document their correctives in the Testing Results at the end of this paper.

Testing Results (Appendix)

Addition operations and numbers confirmed.

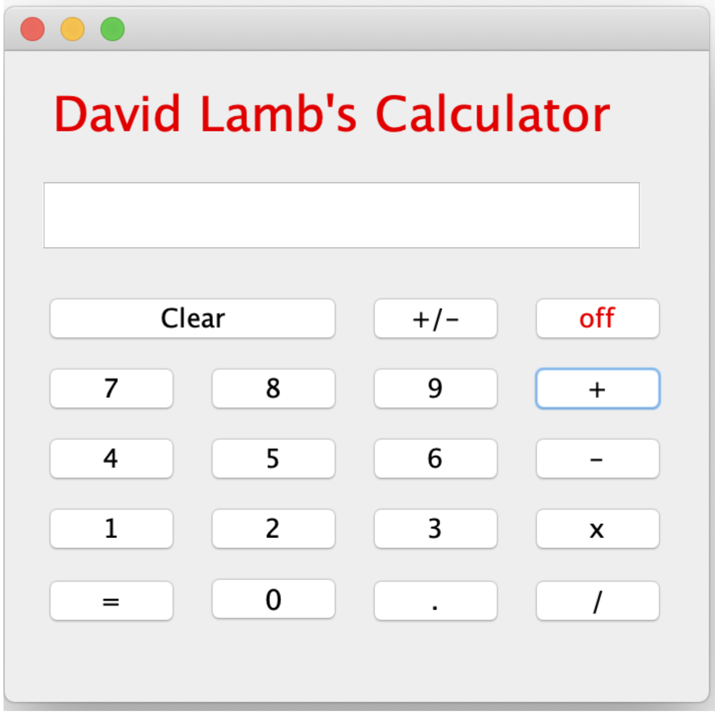
The program starts and the number 7 entered.



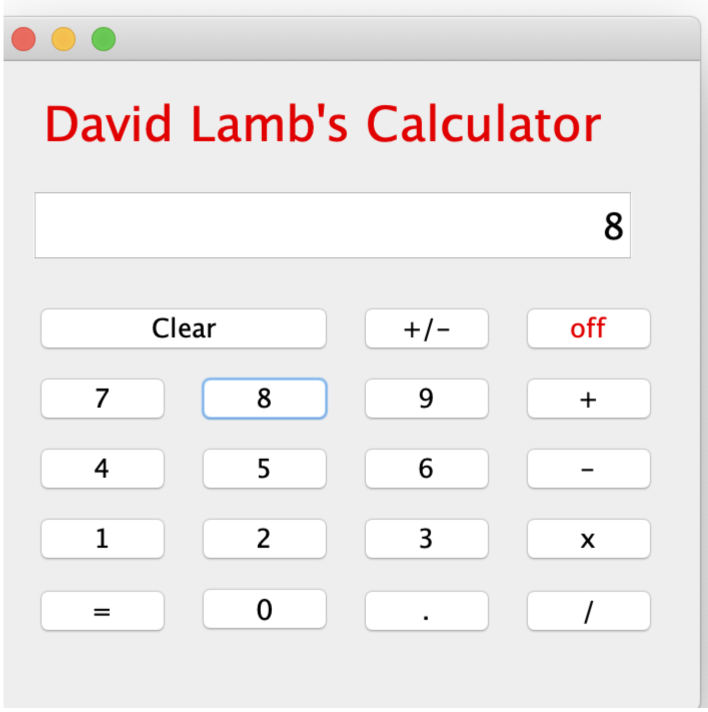
David Lamb's Calculator

7

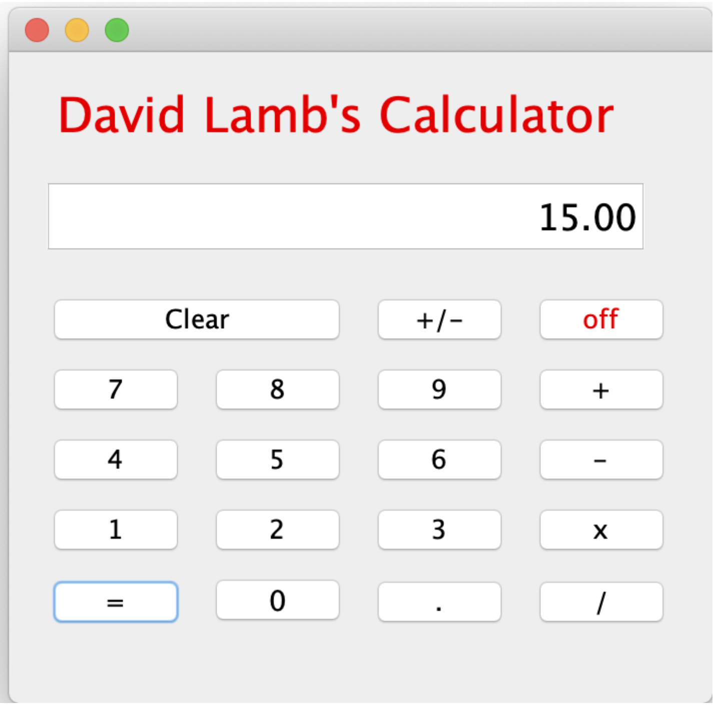
Then the addition ‘+’ operation entered.



The number 8 is entered to add to 7



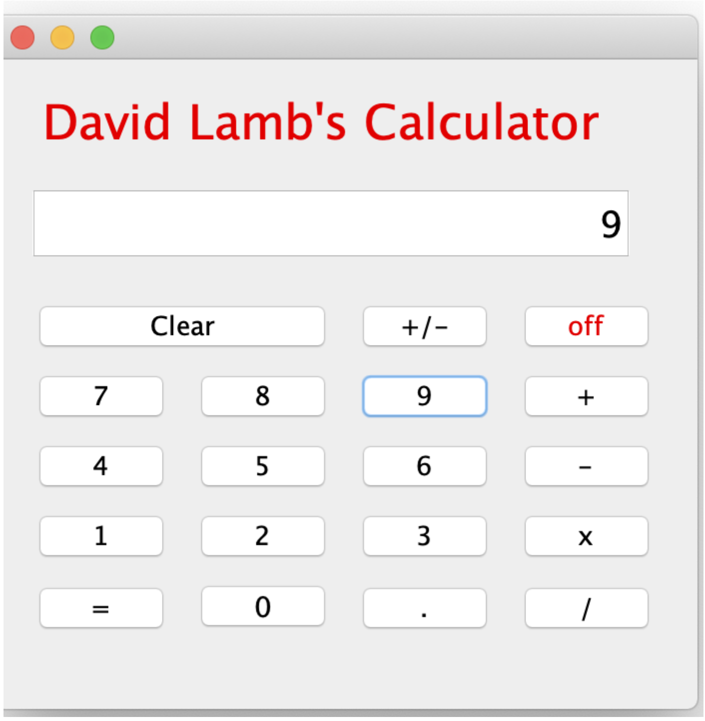
The answer is 15.00 as confirmed by the Calculator.



David Lamb's Calculator

15.00

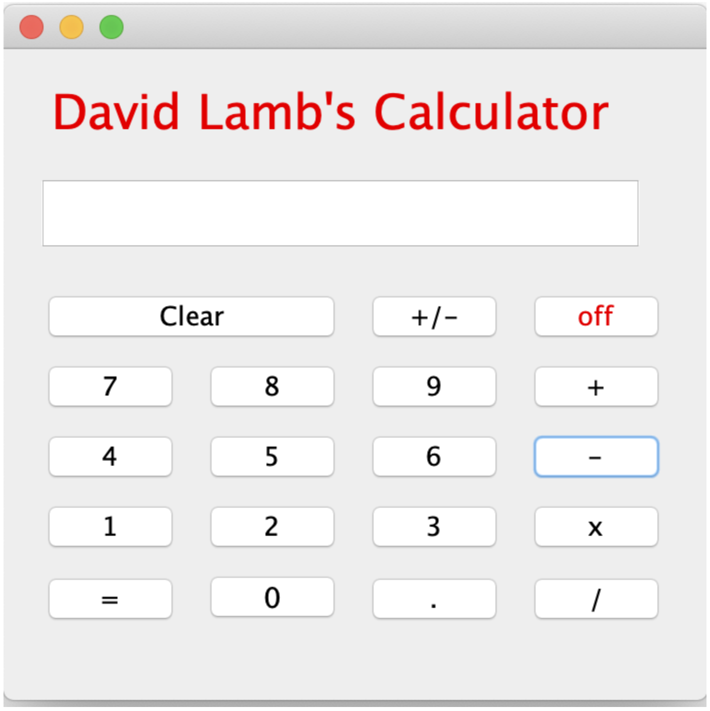
Subtraction operations and numbers confirmed.
9 is entered



David Lamb's Calculator

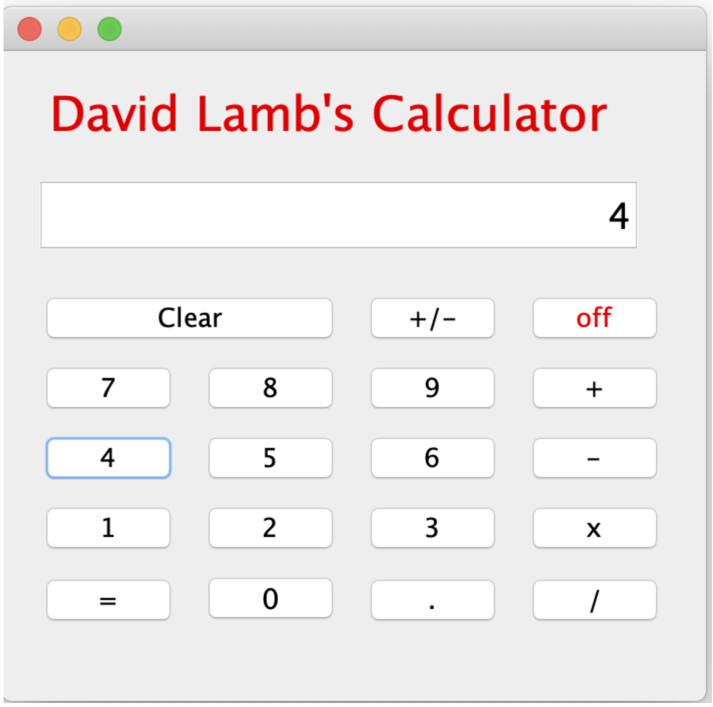
9

Subtraction operation is selected ‘-‘



David Lamb's Calculator

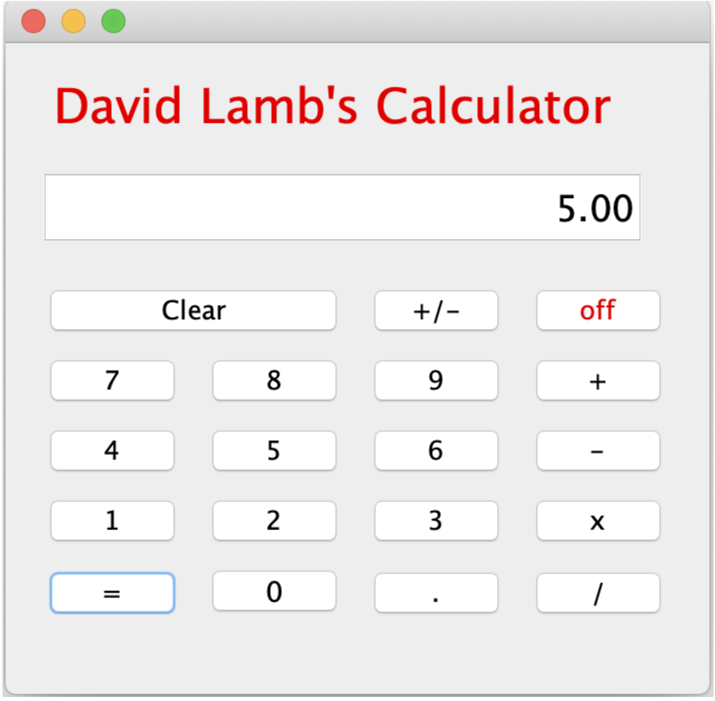
The number 4 is entered.



David Lamb's Calculator

4

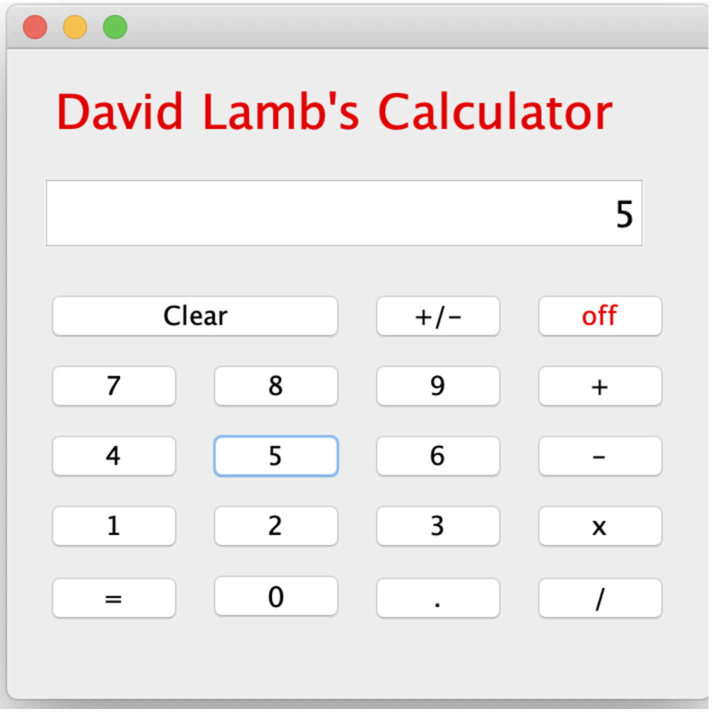
The Equal button is pushed, and the result is 5.00



David Lamb's Calculator

5.00

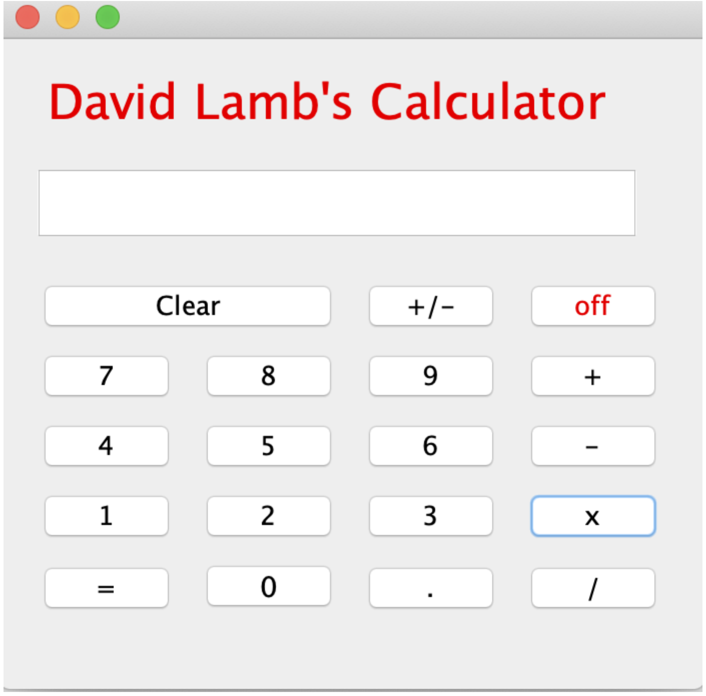
Multiplication operations and numbers confirmed.
5 is entered.



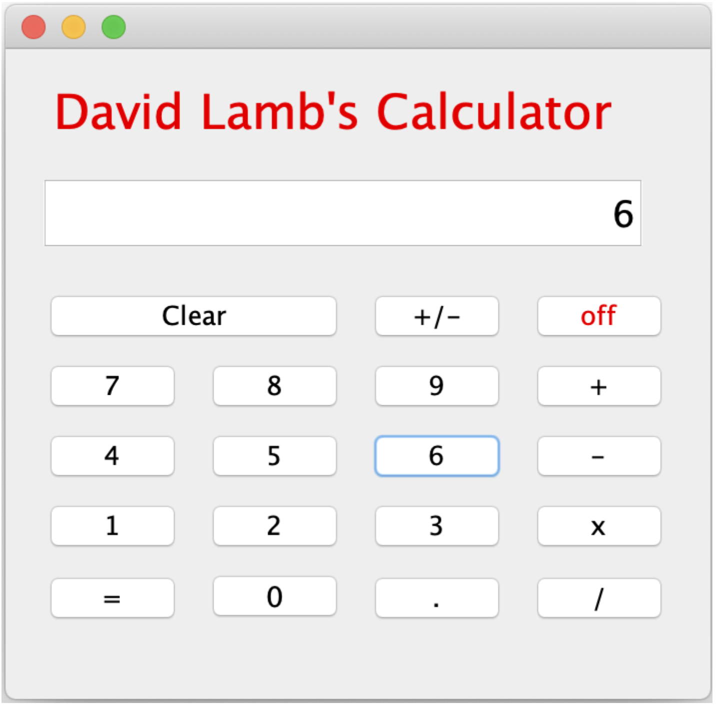
David Lamb's Calculator

5

Multiplication operation is selected ‘x‘.

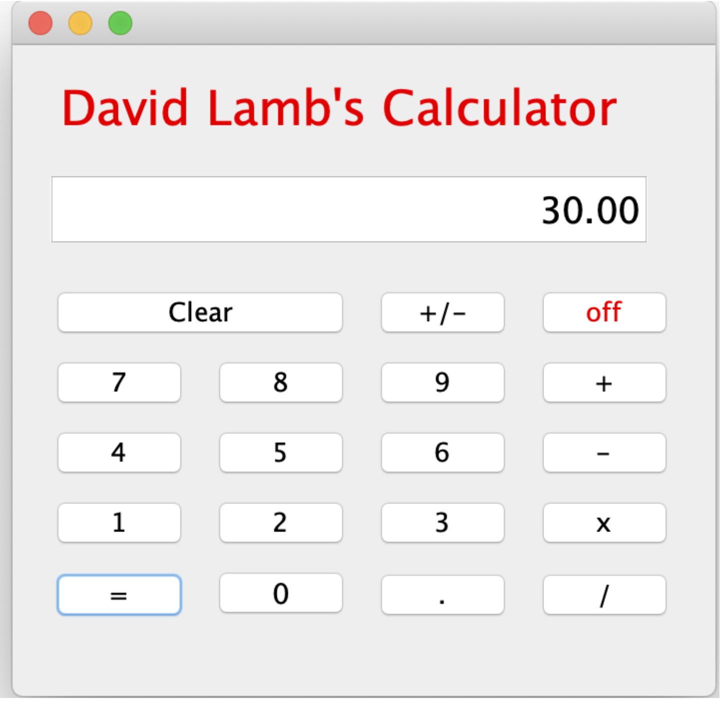


The number 6 is entered.



6

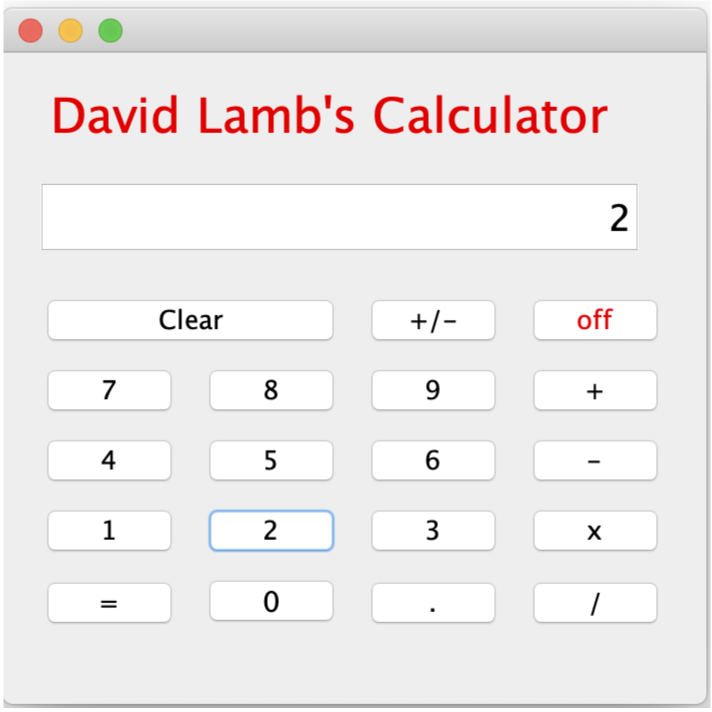
The equal sign button is pushed to display answer 30.00



David Lamb's Calculator

30.00

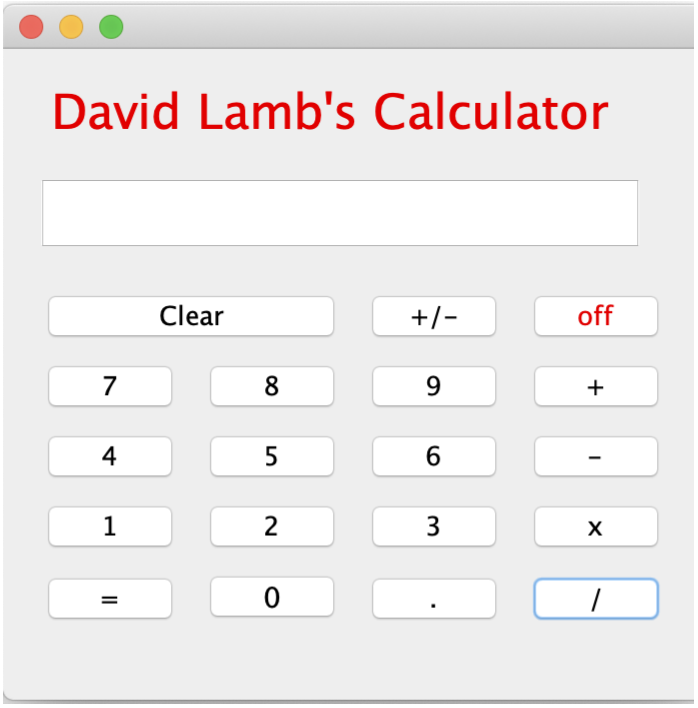
Division operations and numbers confirmed.
The number 2 is entered.



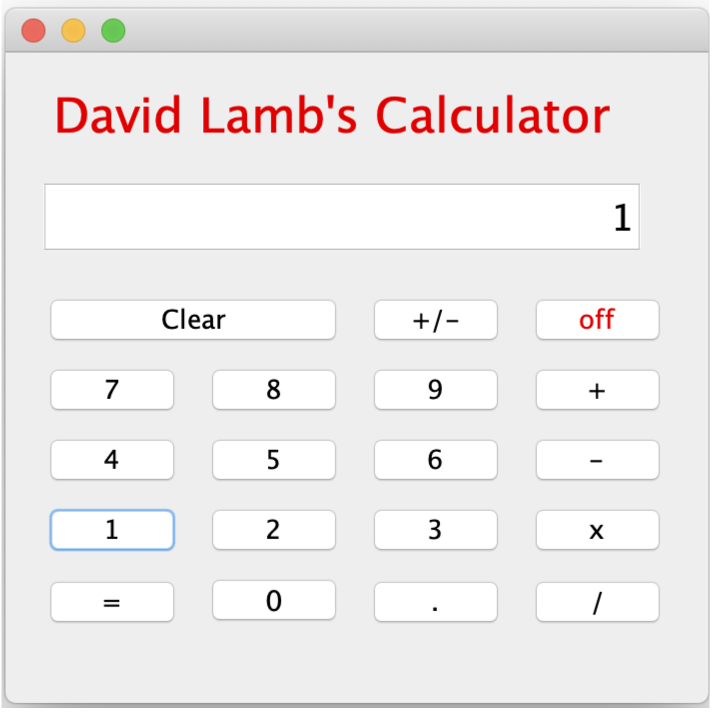
David Lamb's Calculator

2

The division operation is selected.

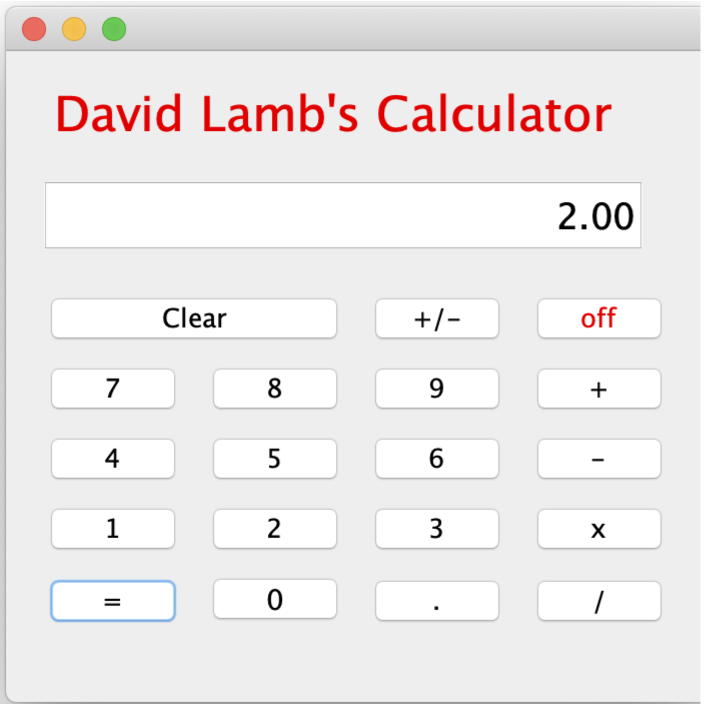


The number 1 is selected.



1

The equal button is pushed answer is displayed.



David Lamb's Calculator

2.00