



HEXADECIMAL CALCULATOR DOCUMENTATION

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Brief Description of Application

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Purpose

A simple JavaFX application perform basic mathematical calculations in hexadecimal numbers, and also display the equivalent values in decimal numbers (ordinary numbers).

Language/Tools Used

JavaFX, Java, FXML

Testing Framework

JUnit (Parameterized Unit Testing)

Software Development Platform

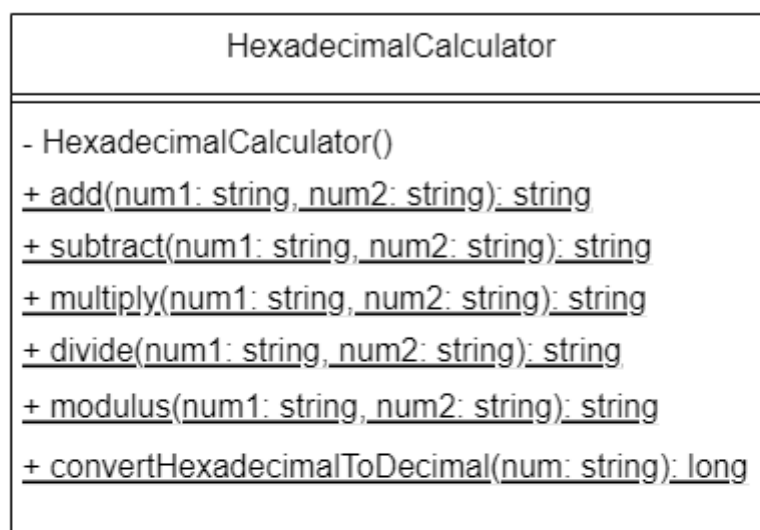
Intellij IDEA IDE by JetBrains

Application Architecture and Design

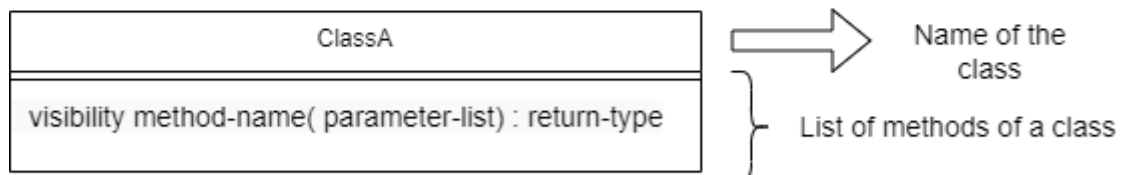
Architecture Pattern Used

Model-View-Controller (MVC) Architectural Pattern

UML Class Diagram of HexadecimalCalculator



Legend



+ represent public visibility

- represent private visibility

underlinedMethod() represent static method

Format of Parameter List: argument-name: data-type

Application Pseudocode

Try:

Obtain the two hexadecimal numbers the user entered;

Obtain the math operation which the user selected (i.e. add, subtract, multiply or divide)

Perform the hexadecimal calculation using the two hexadecimal numbers depending on the math operation selected;

Display the result in hexadecimal number;

Display the two hexadecimal numbers and result in decimal numbers equivalent;

Catch:

Display error message (e.g.invalid user input)

EndTry

Application Screenshots

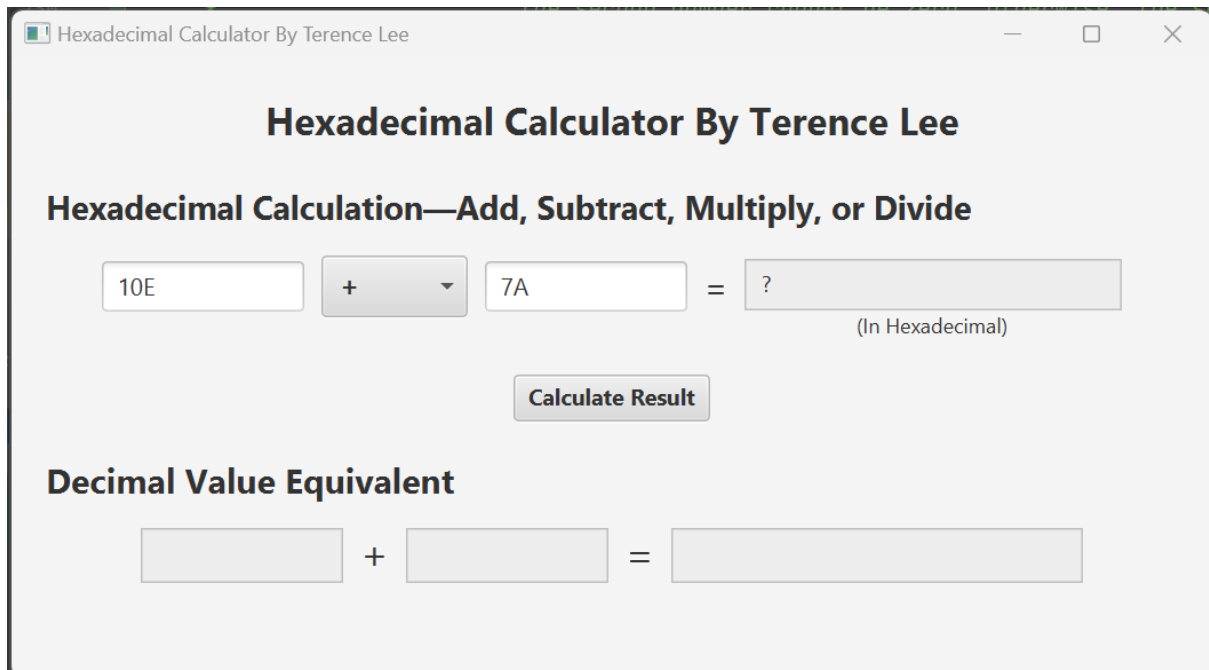


Figure 1: How the application looks like when first launched

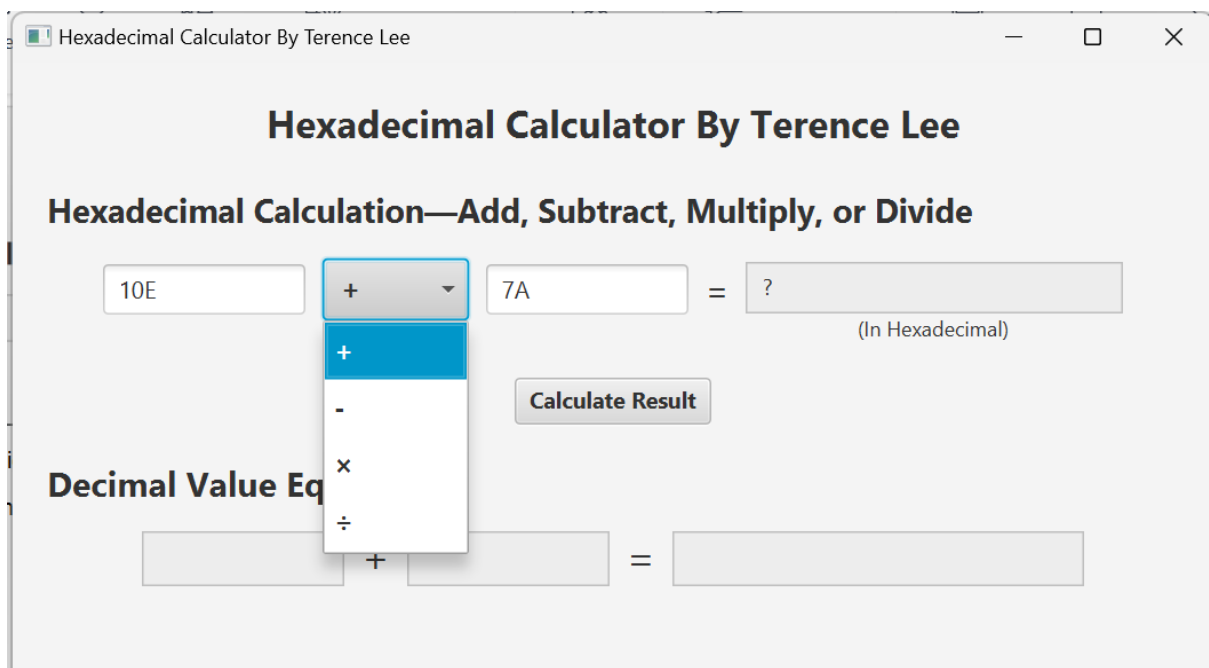
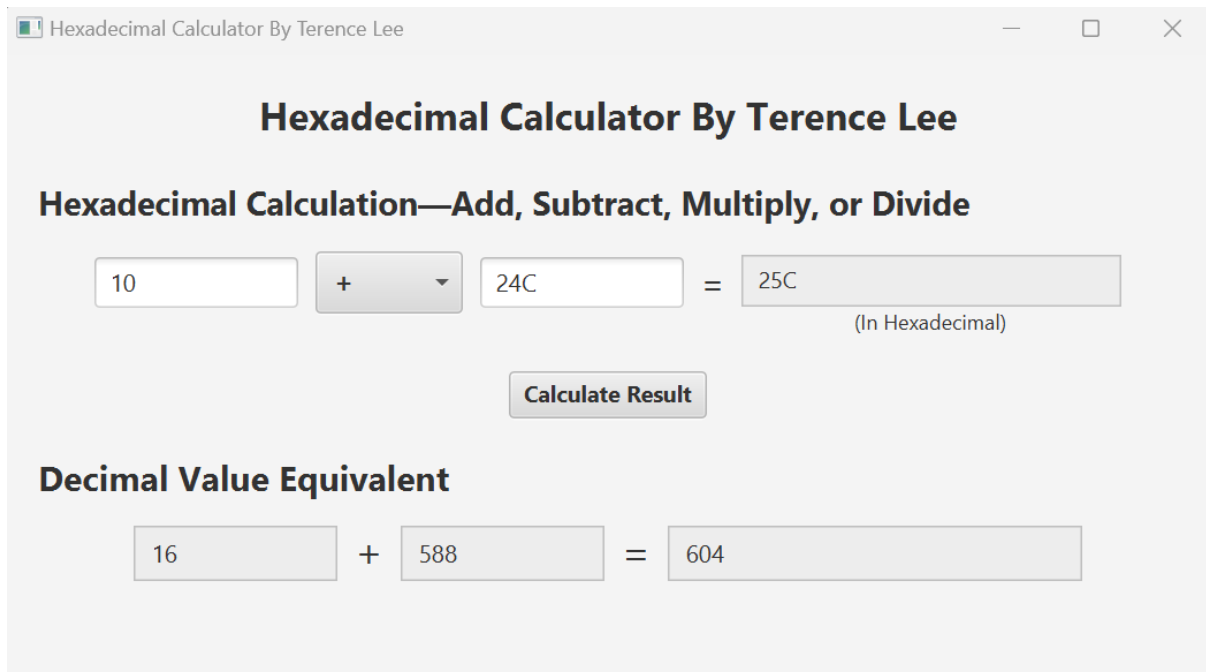


Figure 2: User can choose one of the four basic mathematical operations to calculate hexadecimal numbers

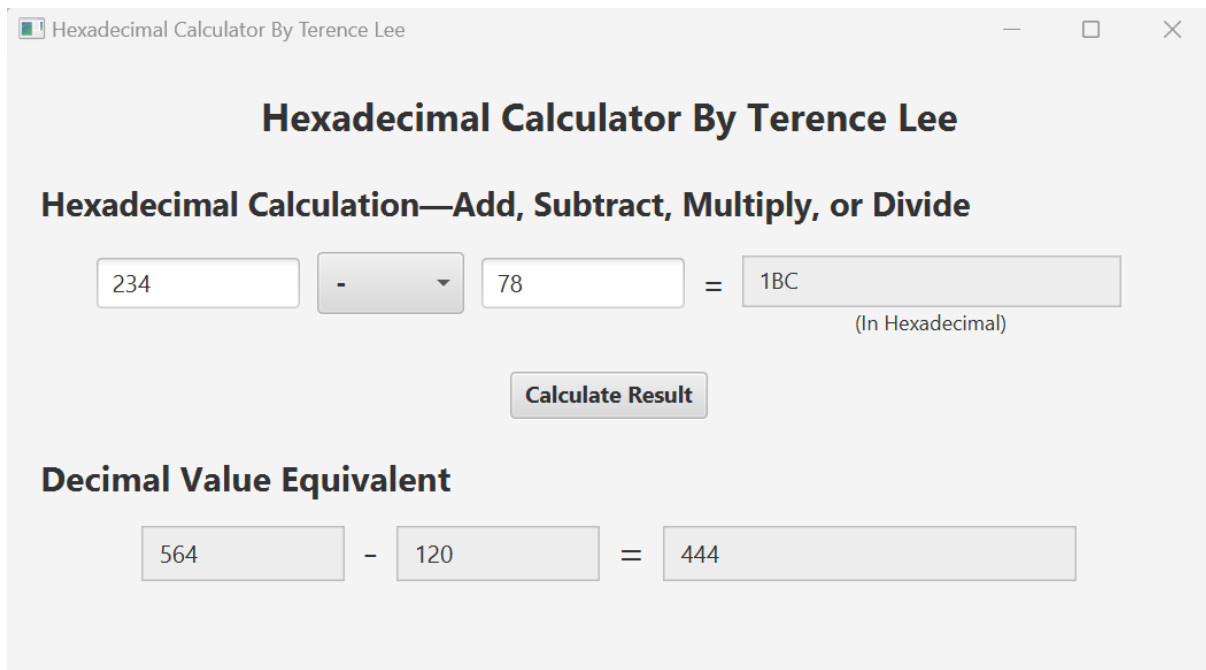
Testing Addition



The screenshot shows a window titled "Hexadecimal Calculator By Terence Lee". The main heading is "Hexadecimal Calculation—Add, Subtract, Multiply, or Divide". The interface displays a hexadecimal addition: the number "10" is in a text box, followed by a "+" button and a dropdown arrow, then "24C" in another text box, an "=" sign, and "25C" in a larger result box. Below the result box is the text "(In Hexadecimal)". A "Calculate Result" button is centered below the calculation. Underneath, the section "Decimal Value Equivalent" shows the same operation in decimal: "16" in a text box, a "+" button, "588" in another text box, an "=" sign, and "604" in a larger result box.

Figure 3: Application display results of the addition operation in hexadecimal, along with the decimal value equivalent at the bottom

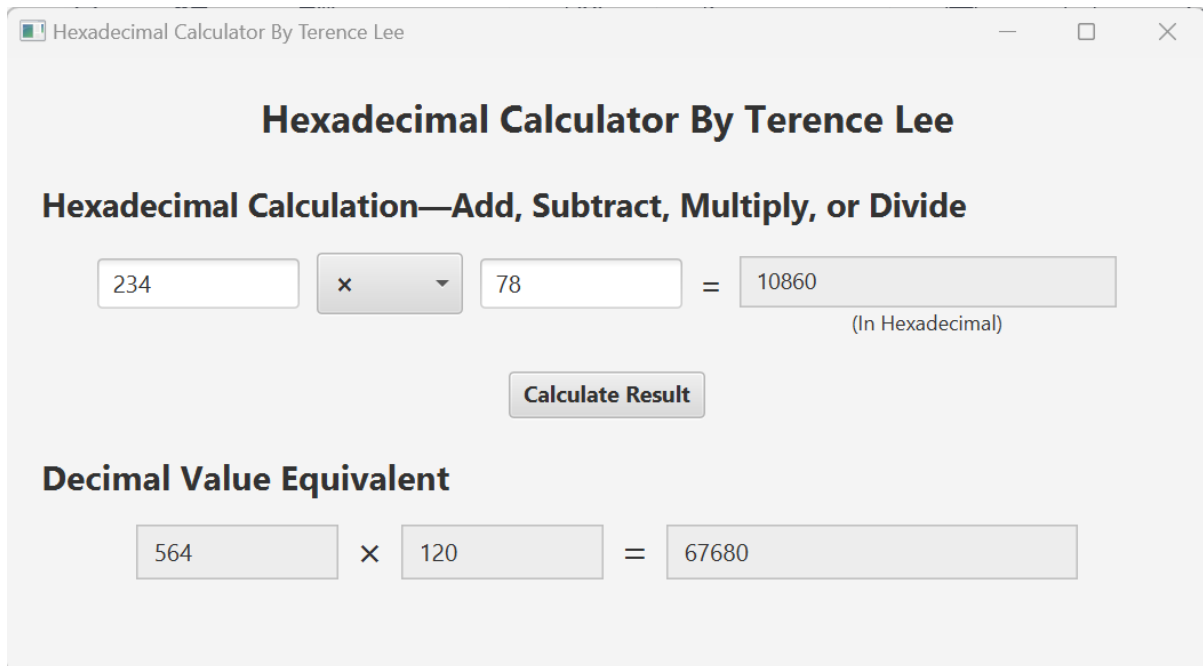
Testing Subtraction



The screenshot shows a window titled "Hexadecimal Calculator By Terence Lee". The main heading is "Hexadecimal Calculation—Add, Subtract, Multiply, or Divide". The interface displays a hexadecimal subtraction: the number "234" is in a text box, followed by a "-" button and a dropdown arrow, then "78" in another text box, an "=" sign, and "1BC" in a larger result box. Below the result box is the text "(In Hexadecimal)". A "Calculate Result" button is centered below the calculation. Underneath, the section "Decimal Value Equivalent" shows the same operation in decimal: "564" in a text box, a "-" button, "120" in another text box, an "=" sign, and "444" in a larger result box.

Figure 4: Application display results of the subtraction operation in hexadecimal, along with the decimal value equivalent at the bottom

Testing Multiplication



Hexadecimal Calculator By Terence Lee

Hexadecimal Calculation—Add, Subtract, Multiply, or Divide

234 × 78 = 10860
(In Hexadecimal)

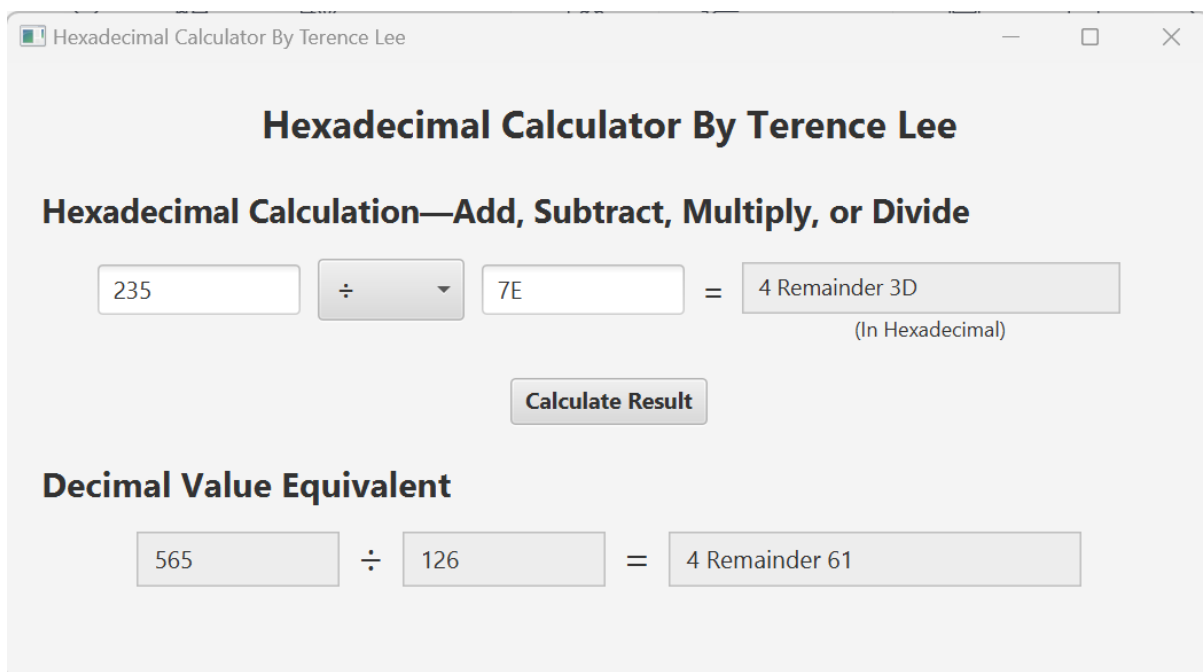
Calculate Result

Decimal Value Equivalent

564 × 120 = 67680

Figure 5: Application display results of the multiplication operation in hexadecimal, along with the decimal value equivalent at the bottom

Testing Division



Hexadecimal Calculator By Terence Lee

Hexadecimal Calculation—Add, Subtract, Multiply, or Divide

235 ÷ 7E = 4 Remainder 3D
(In Hexadecimal)

Calculate Result

Decimal Value Equivalent

565 ÷ 126 = 4 Remainder 61

Figure 5: Application display results of the division operation in hexadecimal, along with the decimal value equivalent at the bottom

Testing Division By Zero

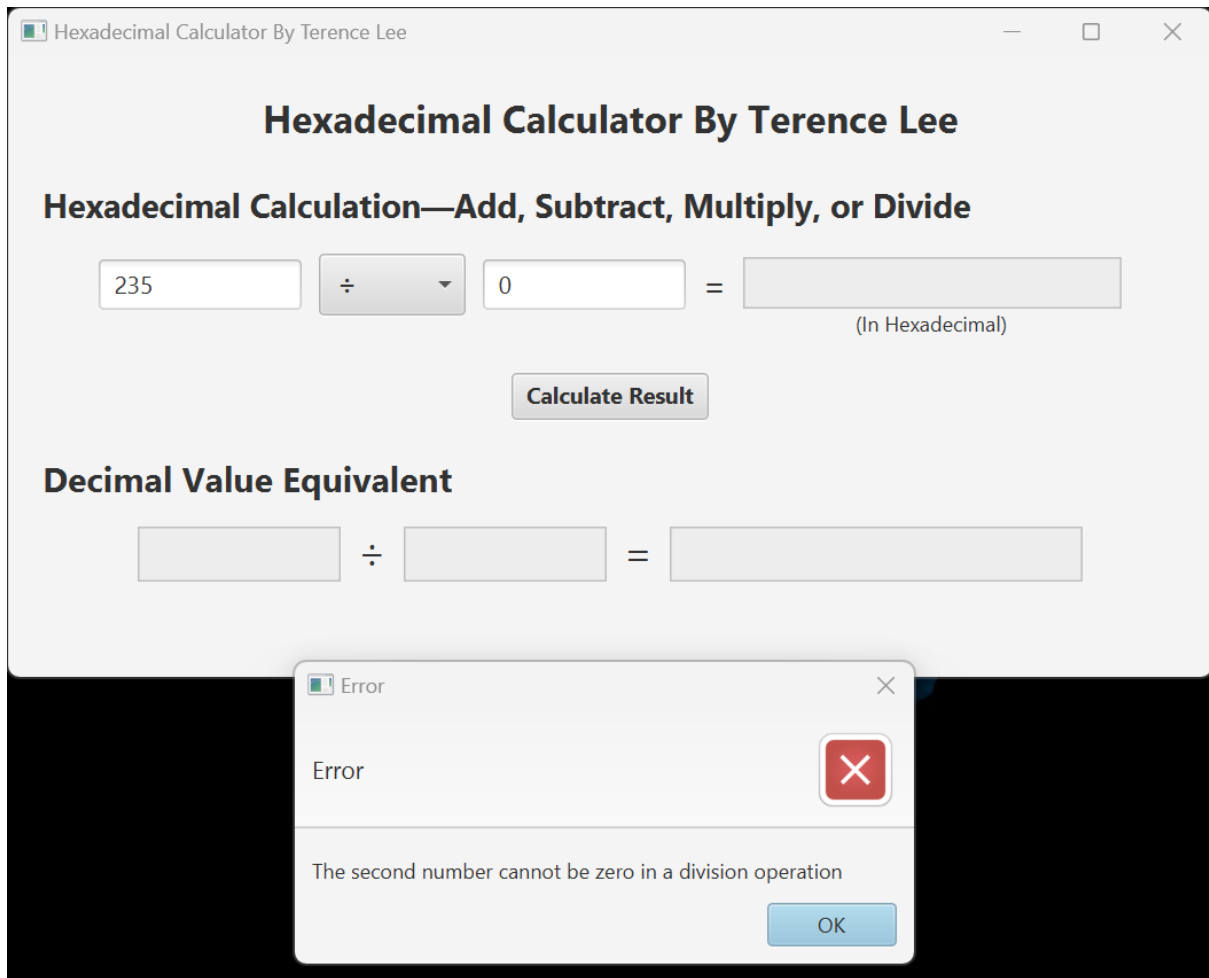


Figure 6: Application displaying error message if the user attempts to divide a hexadecimal number by zero (expected results)

Testing Performing Math Operation on Invalid Number

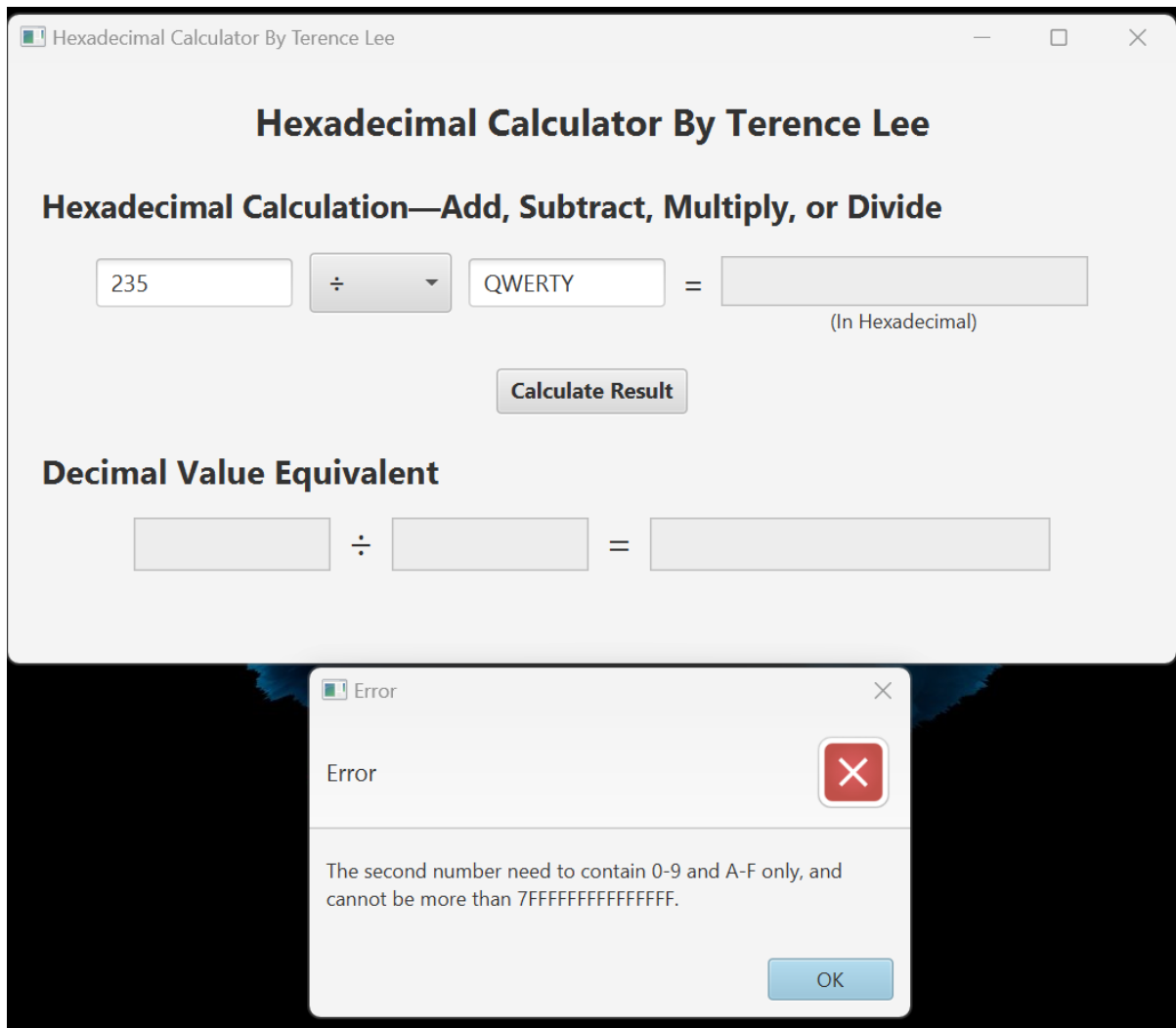


Figure 7: Application displaying error message if the user attempts to add to an invalid hexadecimal number (expected results)