Homework 00
Binary Changer
Due 09/15/2023 by 11:55PM

Objective:

Write a program that accepts two four-digit binary numbers, converts them to decimal values, adds them together, and prints both the decimal values and the result of the addition.

Requirements:

- Functionality. (80pts)
  - No Syntax, Major Run-Time, or Major Logic Errors. (80pts*)
    - *Code that cannot be compiled due to syntax errors is nonfunctional code and will receive no points for this entire section.
    - *Code that cannot be executed or tested due to major run-time or logic errors is nonfunctional code and will receive no points for this entire section.
  - Clear and Easy-To-Use Interface. (10pts)
    - Users should easily understand what the program does and how to use it.
    - Users should be prompted for input and should be able to enter data easily.
    - Users should be presented with output after major functions, operations, or calculations.
    - All the above must apply for full credit.
  - Users must be able to enter a 4-bit binary number in some way. (10pts)
    - No error checking is needed here and you may assume that users will only enter 0's and 1's, and they will only enter 4 bits.
  - Binary to Decimal Conversion (50pts)
    - You may assume that users will only give numbers that add up to 15.
    - See the section Hint for more details.
  - Adding Values (10pts)
    - Both decimal values must be added together and printed out.
  - You may NOT use Integer.parseInt(<<STRING>>, 2) or any automatic converter (80pts*).
    - *The use of specifically Integer.parseInt(<<STRING>>,2) will result in a 0 for this entire section.
    - You may use Integer.parseInt(<<STRING>>).
- Coding Style. (10pts)
  - Readable Code
    - Meaningful identifiers for data and methods.

        - Proper indentation that clearly identifies statements within the body of a class, a method, a branching statement, a loop statement, etc.
        - All the above must apply for full credit.
- Comments. (10pts)
    - Your name in the file. (5pts)
    - At least 5 meaningful comments in addition to your name. These must describe the function of the code it is near. (5pts)

Hint:
A simple way to convert a binary value to a decimal value.

1. Multiply each binary digit by its corresponding base 2 placement value.

Binary Digit	b_0	b_1	b_2	b_3
Base 2 Value	2^3	2^2	2^1	2^0
Result	$b_0 \times 2^3$	$b_1 \times 2^2$	$b_2 \times 2^1$	$b_3 \times 2^0$

Example:

Binary Digit	0	1	1	1
Base 2 Value	2^3	2^2	2^1	2^0
Result	0	4	2	1

2. Add the values together to get the decimal value.

Binary Value = $b_0 \times 2^3 + b_1 \times 2^2 + b_2 \times 2^1 + b_3 \times 2^0$

Example:

Binary Value = 0 + 4 + 2 + 1 = 7

Finally:
Upload the solution's source file (.JAVA extension) to the CSCE Dropbox