CSE 1322L - Lab 7

Introduction

In this lab, you will practice writing recursive methods for solving the following problems:

       Multiplication
       Division
       Remainder
       Repeating a string N times
       Check if a string is the reverse of another

Requirements

The features described below must be in your program:

The following <u>static</u> methods need to be present in your driver class. Note that their **solution must be recursive; non-recursive solutions will be heavily penalized**.

- **int recursiveMultiply(int, int):** Returns the product of the first argument by the second argument.
  - No need to worry about negative arguments
  - Note that no multiplication operation is necessary (i.e.: this method does not need the * operator)
- **int recursiveDivision(int, int):** Returns the quotient (i.e.: the whole part of the division) of the first argument by the second argument.
  - **<u>If the second argument is 0, the method should return -1</u>**
  - No need to worry about negative arguments
  - Note that no division operation is necessary (i.e.: this method does not need the / operator)
- **int recursiveRemainder(int, int):** Returns the remainder of dividing the first argument by the second argument.
  - **<u>If the second argument is 0, the method should return -1</u>**
  - No need to worry about negative arguments
  - Note that no remainder operation is necessary (i.e.: this method does not need the % operator)
- **String recursiveEcho(String, int)**: Returns the first string concatenated into itself N times, where N is the second argument.
  - No need to worry about the second argument being negative
  - Note that no loops are necessary (i.e.: this metho

Ignore casing

Note that no loops are necessary (i.e.: this method does not need a FOR, WHILE, or DO-WHILE loop)

Main(): implement the following menu options:

1. **Multiply 2 numbers**: Prompt the user for two numbers, then use them as arguments to call recursiveMultiply(), printing the result.
2. **Divide 2 numbers**: Prompt the user for two numbers, then use them as arguments to call recursiveDivision(), printing the result.
3. **Mod 2 numbers**: Prompt the user for two numbers, then use them as arguments to call recursiveRemainder(), printing the result.
4. **Echo sentence**: Prompt the user for a sentence, and how many times it should be repeated. Pass both inputs to recursiveEcho() and print its result.
5. **Determine if reverse**: Prompt the user for 2 sentences. Print an appropriate message depending on if the two sentences are the opposite of each other.
6. **Quit**: Terminates the program

Deliverables

Lab7.java

Considerations

Recall that recursive solutions have two components to it: a base case and a recursive case.

There is no upper limit to the number of recursive cases or base cases that your solution can have.

This was mentioned above but it bears repeating: besides your main(), none of your other methods should have any loops in them. Your solutions need to be strictly recursive.

Similarly, for the methods that perform mathematical operations, you do not need to use the *, /, or % operators.

Sample Output (user input in red)

```
1. Multiply 2 numbers
2. Divide 2 numbers
3. Mod 2 numbers
4. Echo sentence
5. Determine if reverse
6. Quit
Enter option:
Enter the first number:
Enter the second number:
```

```
Your product is 16

1.  Multiply 2 numbers
2.  Divide 2 numbers
3.  Mod 2 numbers
4.  Echo sentence
5.  Determine if reverse
6.  Quit
Enter option:
Enter the first number:
Enter the second number:
Your product is 36

1.  Multiply 2 numbers
2.  Divide 2 numbers
3.  Mod 2 numbers
4.  Echo sentence
5.  Determine if reverse
6.  Quit
Enter option:
Enter the first number:
Enter the second number:
Your quotient is 2

1.  Multiply 2 numbers
2.  Divide 2 numbers
3.  Mod 2 numbers
4.  Echo sentence
5.  Determine if reverse
6.  Quit
Enter option:
Enter the first number:
Enter the second number:
Your quotient is 7

1.  Multiply 2 numbers
2.  Divide 2 numbers
3.  Mod 2 numbers
4.  Echo sentence
5.  Determine if reverse
6.  Quit
Enter option:
```
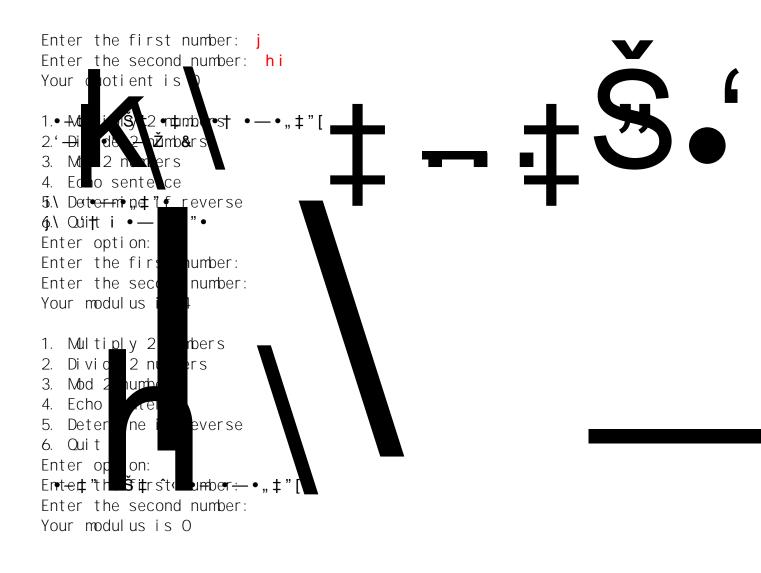
Enter the first number: j
Enter the second number: hi
Your quotient is 0

1. Multiply 2 numbers
2. Divide 2 numbers
3. Mod 2 numbers
4. Echo sentence
5. Determine if reverse
6. Quit
Enter option:
Enter the first number:
Enter the second number:
Your modulus is 4

1. Multiply 2 numbers
2. Divide 2 numbers
3. Mod 2 numbers
4. Echo sentence
5. Determine if reverse
6. Quit
Enter option:
Enter the first number:
Enter the second number:
Your modulus is 0

6. Quit
Enter option:
Enter your sentence:
Repeat how many times?
Your sentence repeated 4 times is
bake the cake!bake the cake!bake the cake!bake the cake!

1. Multiply 2 numbers
2. Divide 2 numbers
3. Mod 2 numbers
4. Echo sentence
5. Determine if reverse
6. Quit
Enter option:
Enter a sentence:
Enter another sentence:
The sentences are NOT the opposite of each other.

1. Multiply 2 numbers
2. Divide 2 numbers
3. Mod 2 numbers
4. Echo sentence
5. Determine if reverse
6. Quit
Enter option:
Enter a sentence:
Enter another sentence:
The sentences are the opposite of each other.

1. Multiply 2 numbers
2. Divide 2 numbers
3. Mod 2 numbers
4. Echo sentence
5. Determine if reverse
6. Quit
Enter option:
Shutting off...