CS 278/465
Programming Assignment 9
More Recursion

All programs you submit in this class must follow the Documentation and Style Guidelines.
This document can be found in the Canvas Modules.

All programs you submit in this class must compile with the Oracle Java compiler on the Linux machines in SH 118 or SH 118B.

The programs you submit in this course must be your own work.
Any program that shows evidence of cheating will receive a grade of zero.

The Assignment

Write a complete Java program named PA9.java that contains the following 3 methods.

1. Write a public, static, recursive method called **gcd** that will accept two integer parameters named **num1** and **num2**. The method must calculate and return the greatest common divisor of num1 and num2.

   Parameters num1 and num2 can contain any integer value. (No error case.)

   The return value must be a positive integer.

   The method cannot contain any loops.

   Base case(s) must be written before the recursive step(s).

   Base case(s) and recursive steps(s) must be commented.

2. Write a public, static, recursive method called **factors** that will accept two integer parameters named **number** and **possibleFactor**. The method must calculate and print the positive factors of number, all on one line, in increasing order, separated by a comma and a space. Do not print a comma after the last factor.

   Do not change the first parameter when you make the recursive call.

   When you call the method from the main, pass the same number for both parameters.

```
factors( 12, 12 );
```

Expected output of this call:

```
Factors of 12
1, 2, 3, 4, 6, 12
```

   There is no return value.

   The number and the possibleFactor must be positive. (Error case needed.)

   The method cannot contain any loops.

   Error case(s) must be written before the base case(s).

   Base case(s) must be written before the recursive step(s).

   Base case(s) and recursive steps(s) must be commented.

3. Write a public, static, recursive method called **lowercase** that will accept one String parameter named **sentence**. The method must print the lowercase letters that appear in the String, all on one line, in the order in which they appear in the String, with no separator.

   There is no return value.

   There are no restrictions on what the String can contain. (No error case.)

   The method cannot contain any loops.

   Base case(s) must be written before the recursive step(s).

   Base case(s) and recursive steps(s) must be commented.

4. Write a main method that will thoroughly test each of the 3 methods above.

   Don't write comments in the main.

   All output must contain meaningful messages with information about which method is being tested and the parameter values that are used for each test.

Submit PA9.java on Canvas.