CPSC 233 – Coding Challenge 5 – Practice 1

This is a practice coding challenge. You may ask other students and your TA any questions you wish. Note that you are expected to complete the actual coding challenge independently. Having a solution for this coding challenge will not help you come up with your own solution for the actual coding challenge. Only if you can solve this practice independently can you be confident that you can complete the actual coding challenge successfully. See previous coding challenges for rules for coding challenges and best practices for success.

Remember to always create a 'skeleton' first and compile and test this using the provided JUnit test. For this coding challenge, you will be asked to create one class. Make sure you create a skeleton of all classes first. You can upload your solution to WebCAT directly. You do not need to place it in a zip file.

To prepare for this coding challenge, make sure you can do recursion over numbers, lists and strings. In addition to this provided practice, you can do additional practice (that is also automatically tested) at http://codingbat.com/java/Recursion-1

Create a class called RecursionChallenge that contains the following methods.

1. Method numOfDigits that takes an int as an arguments and returns an int. The method should return the number of digits in the argument. For example, -120 has three digits. Hint: Dividing a number by 10 removes the last digit from the number. Do not use the classes Math, String or StringBuilder in your solution.
2. Method countChar that takes a String and a char as arguments and returns, as an int, the number of times the char appears in the String. For example, when passing "Mississippi" and 's' to countChar the method should return 4. An upper case and lower case character should be considered different characters (and your solution should be case sensitive).
3. Method addDigits that takes an int as an argument and returns the sum of the digits in the argument. You may assume that the number provided is positive. For example 12345 result in the computation 1 + 2 + 3 + 4 + 5 = 15. Do not use the classes Math, String or StringBuilder in your solution.

Notes:

- It is important that your solution is a recursive solution, it is not sufficient that it has the required functionality. So along with automated tests, we will also scan your submission and check for loops. Make sure you don't use the words "for" and "while" in your submission, not even for the documentation.
- For the coding challenge, there will be minor differences between the tests provided and the tests used in WebCAT. The tests in WebCAT will test the same scenarios but will use different values for the arguments. So make sure you don't use long if-else statements to code to the test cases.