Lab Session 18: Strings and basic arrays

**Reminder: If you have not done previous labs, you should start with those!**

Theory:

1. What prints in the following code?  
     
   int[] x = new int[] {10, 20, 30, 40, 50};  
   x[0] = x[1] + x[2];  
   x[2] = x[0] + x[3];  
   System.out.println(x[0] + “ “ + x[2] + x.length);
2. What prints in the following code?  
     
   String foo = “abcdefg”;  
   System.out.println((char) (foo.charAt(3) + 3));  
   int bar = foo.length();  
   System.out.println( foo.charAt( bar – 1) );
3. What do you think will happen if the following snippet of code executes? Try it out to see if you are right!  
     
   String hi = “hello”;  
   int len = hi.length();  
   System.out.println(hi.charAt(len));

Application:

1. Write a program where you let the user enter a String (use reader.nextLine() to read a String). You should then count the number of words in the String by counting the number of spaces. (If there are 3 spaces for example, there are 4 words.) You may assume that the user has never entered 2 consecutive spaces. As part of this program, you should have a method public static int countSpaces(String s) which returns the number of spaces in s. All printing and scanning should be done in the main method.
2. Add to your above program a method checkConsecutiveSpaces. This method should take as input a String and return a Boolean of true if there are ever 2 spaces in a row at any point in the String. It should return false if there are *never* 2 spaces in a row.
3. Add to your main method code to check if the user has entered two spaces in a row. If they have, your program should print an error message instead of printing the number of words.
4. Write a program where you let the user enter a String. You should then count how many capital letters they entered an print this result to the screen. As part of this program, you should have a method public static int countCapitals(String s) which returns the number of capital letters in s. All printing and scanning should be done in the main method.