Lab 4: String Exercises

(Adapted from Lab A10.1 from ICT Java Curriculum)

This lab will be to solve a variety of problems involving Strings. Each problem below may be solved with its own method. Helper methods are encouraged for methods that require many steps. Since these will all be "utility" methods, you will need to make each method static. Please include all methods in one lab file [LabFour.java]. Because this lab's objective is to familiarize you with certain ways of processing Strings, *you may not use arrays or the String methods* `replace`, `replaceAll`, *or* `replaceFirst`.

Write a method that:

1. Takes in a string and returns the exact reversal of the String.
   Example: `reverse("AP Computer Science")` → `"ecneicS retupmoC PA"`
   `reverse("")` → `""`
   `reverse("J")` → `"J"`

2. Takes in two String arguments and returns a version of the first String with all instances of the second String removed.
   Example: `removeAll("Remove them all!", "e")` → `"Rmov thm all!"`
   `removeAll("Remove them all!", "em")` → `"Rove th all!"`
   `removeAll("", "e")` → `""`
   `removeAll("Remove them all!", "zoo")` → `"Remove them all!"`
   `removeAll("Remove them all!", "")` → `"Remove them all!"`

3. Receives a String argument and determines whether or not the given String is a palindrome, ignoring case and punctuation. A palindrome reads the same forwards and backwards.
   Example: `isPalindrome("Java!")` → `false`
   `isPalindrome("A man, a plan, a canal: Panama");` → `true`
   `isPalindrome("J")` → `true`
   `isPalindrome("")` → `true`

4. Receives a phrase and returns the converted phrase to Pig Latin. A word is translated into Pig Latin according to the following rules:

   a. If there are no vowels in the word, then add "ay" to the end of it. (a, e, i, o, and u are all the vowels considered).
   b. If the word begins with a vowel, then add "yay" to the end of it.
   c. Otherwise, take all the letters up to the first vowel and move it to the end and add "ay".

   Pre-condition: phrase will not contain punctuation, only alphabetic characters and spaces.

   Hint: Break down the problem into smaller parts and code a helper method or two!

Example:

```
toPigLatin("I am fluent in Pig Latin") →
                        "Iyay amyay uentflay inyay igPay atinLay"
toPigLatin("Hey") → "Heyay"
toPigLatin("") → ""
```

Grading (15 total points):

3 points each for each method
3 points for adequate programming style (naming, documentation, indentation, etc.)

Dropbox your zipped project file (with your name on it) to Ms. Nguyen with all completed files. Your methods will be tested with specific cases created by your instructor. **Make sure your methods match those listed above.** Test your methods thoroughly prior to submission!