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| **Unit:** Language Basics | **Turn In List:** **1. This document** |
| *“I will understand and use strings appropriately in programming.”* | |

**Content Objectives:** Students will familiarize themselves with creating, initializing, splicing and formatting strings.

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| **Starter Activity** |
| Include code for creating and setting a string called fullName to the value of your first and last name.  String firstName = "Jonathan ";  String lastName = "Su ";  String fullName = (firstName + lastName); |

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| **Assignment:** |
| Students will use the following websites and internet searches to complete the table below:   * **C++ Strings:**[**http://www.tutorialspoint.com/cplusplus/cpp\_constants\_literals.htm (Links to an external site.)**](http://www.tutorialspoint.com/cplusplus/cpp_constants_literals.htm) * **C++ Literals:**[**http://www.tutorialspoint.com/cplusplus/cpp\_constants\_literals.htm (Links to an external site.)**](http://www.tutorialspoint.com/cplusplus/cpp_constants_literals.htm) * **C++ String Methods:**[**http://www.cplusplus.com/reference/string/string/ (Links to an external site.)**](http://www.cplusplus.com/reference/string/string/) * **Java Strings:**[**http://www.tutorialspoint.com/java/java\_strings.htm (Links to an external site.)**](http://www.tutorialspoint.com/java/java_strings.htm) * **Java Literals:**[**http://www.tutorialspoint.com/java/java\_quick\_guide.htm (Links to an external site.)**](http://www.tutorialspoint.com/java/java_quick_guide.htm) * **Python Strings:**[**http://www.tutorialspoint.com/python/python\_strings.htm (Links to an external site.)**](http://www.tutorialspoint.com/python/python_strings.htm) * **C# Strings:**[**https://msdn.microsoft.com/en-us/library/system.string(v=vs.110).aspx (Links to an external site.)**](https://msdn.microsoft.com/en-us/library/system.string(v=vs.110).aspx) |

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| **Include Sample Code Concepts Below (copy and paste lines from editor)** | |
| Code necessary to convert fullName to all upper case characters | String uppercase = fullName.toUpperCase();  System.out.println(uppercase); |
| Code necessary to convert fullName to all lower case characters | String lowercase = fullName.toLowerCase();  System.out.println(lowercase); |
| Code necessary to concatenate your name variable with your age in years. Output would be something like: “FirstName LastName is 17” | System.out.println(fullName + "is 15 years old."); |
| Syntax for including the forward slash in a string or print statement. | System.out.println("There is a \\ in this sentence."); |
| Code necessary to retrieve the length of fullName string (see starter) | int nameLength = fullName.length();  System.out.println(nameLength); |
| Research: Code to split or separate a string (substring) into two or more values | for (String separated: fullName.split(" ")) {  System.out.println(separated);  }  String a = fullName.substring(4);  System.out.println(a); |

Pseudocode an English to Pig Latin converter requesting a first and/or last name from user.

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| 1. Provide instructions and program info. 2. Receive a string from the user using the scanner class. 3. Set the input equal to a variable called userInput. 4. Format the text (all lowercase, replace symbols). 5. Print out "original text" and "translated text" to let user know. 6. Break the string apart into individual words using the String split method. 7. For each word, check to see if the first letter is a vowel. 8. If it is, print the word and add "yay" to the end. 9. If not, create a loop to go through the word's characters to find the index of the first vowel and set it equal to a variable called firstVowelPos. Print out the word substrings and add "ay" to the end. 10. Print out the punctuation and backspace since an extra space was added to prevent the symbol from getting mixed in with the word. 11. Repeat steps 7-8 for each word.   This program's definition of Pig Latin:   * Words with vowel as first letter: Leave word alone and add "yay." * Words with consonant as first letter: Take everything before the first vowel, put it at the end, and add "ay." * Words with hyphen: Translate words on opposite sides of the hyphen separately. * The letter 'y' is always treated as a consonant. * Only covers commonly used punctuation. |
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You may work in pairs or small groups to code a ***working*** “PigLatin” converter that alters a first and/or last name to traditional Pig Latin. Java Hint: research substring!

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| // Jonathan Su, Feb. 2021  import java.util.Scanner;  class Main {  static void pigMethod() {  Scanner scanner = new Scanner(System.in);  String userInput = scanner.nextLine().toLowerCase().replaceAll(",", " , ").replaceAll("\\.", " \\.").replaceAll("!", " !").replaceAll("\\?", " \\?").replaceAll("-", " - ").replaceAll(":", " :").replaceAll(";", " ;").replaceAll("\\s{2,}", " ").replaceAll("\"", "");  String consonantEnd = "ay";  String vowelEnd = "yay";  int charCount = 0;  int spaceCount = 0;  int allChars = 0;  System.out.println("\nOriginal text:\n" + userInput);  System.out.println("\nTranslated text:");  for (String eachWord: userInput.split(" ")) {  char firstLetter = eachWord.charAt(0);  boolean isNumber = Character.isDigit(eachWord.charAt(0));  int firstVowelPos = -1;  if (firstLetter == 'a' || firstLetter == 'e' || firstLetter == 'i' || firstLetter == 'o' || firstLetter == 'u') {  System.out.print(eachWord + vowelEnd + " ");  charCount += eachWord.length() + vowelEnd.length();  spaceCount++;  } else if (firstLetter == ',') {  System.out.print("\b, ");  charCount++;  } else if (firstLetter == '.') {  System.out.print("\b. ");  charCount++;  } else if (firstLetter == '!') {  System.out.print("\b! ");  charCount++;  } else if (firstLetter == '?') {  System.out.print("\b? ");  charCount++;  } else if (firstLetter == '-') {  System.out.print("\b- \b");  charCount++;     spaceCount--;  } else if (firstLetter == ':') {  System.out.print("\b: ");  charCount++;  } else if (firstLetter == ';') {  System.out.print("\b; ");  charCount++;  } else if (isNumber == true) {  System.out.print(eachWord + " ");  charCount += eachWord.length();  } else {  for (int i = 0; i < eachWord.length(); i++) {  if (eachWord.charAt(i) == 'a' || eachWord.charAt(i) == 'e' || eachWord.charAt(i) == 'i' || eachWord.charAt(i) == 'o' || eachWord.charAt(i) == 'u') {  firstVowelPos = i;  break;  }  }  if (firstVowelPos > -1) {  System.out.print(eachWord.substring(firstVowelPos) + eachWord.substring(0, firstVowelPos) + consonantEnd + " ");  charCount = charCount + eachWord.substring(firstVowelPos).length() + eachWord.substring(0, firstVowelPos).length() + consonantEnd.length();  spaceCount++;  } else {  System.out.print(eachWord + consonantEnd + " ");  charCount += eachWord.length() + consonantEnd.length();  spaceCount++;  }  }  }  spaceCount--;  allChars = charCount + spaceCount;  System.out.println("\n\nCharacter count (with spaces): " + allChars + "\nCharacter count (excluding spaces): " + charCount + "\nSpace count: " + spaceCount + "\n~~~");  }  public static void main(String[] args) {  System.out.println(" \_\_\_\_\_\_ \_\_ \_\_\_\_\_\_ \_\_ \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_ \_\_ \_\_ ");  System.out.println(" /\\ == \\ /\\ \\ /\\ \_\_\_\\ /\\ \\ /\\ \_\_ \\ /\\\_\_ \_\\ /\\ \\ /\\ \"-.\\ \\");  System.out.println(" \\ \\ \_-/ \\ \\ \\ \\ \\ \\\_\_ \\ \\ \\ \\\_\_\_\_ \\ \\ \_\_ \\ \\/\_/\\ \\/ \\ \\ \\ \\ \\ \\-. \\ ");  System.out.println(" \\ \\\_\\ \\ \\\_\\ \\ \\\_\_\_\_\_\\ \\ \\\_\_\_\_\_\\ \\ \\\_\\ \\\_\\ \\ \\\_\\ \\ \\\_\\ \\ \\\_\\\"\\\_ \\ ");  System.out.println(" \\/\_/ \\/\_/ \\/\_\_\_\_\_/ \\/\_\_\_\_\_/ \\/\_/\\/\_/ \\/\_/ \\/\_/ \\/\_/ \\/\_/ ");  System.out.println("");  System.out.println(" \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_ \_\_ \_\_ \_\_ \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_ ");  System.out.println("/\\ \_\_\_\\ /\\ \_\_ \\ /\\ \"-.\\ \\ /\\ \\ / / /\\ \_\_\_\\ /\\ == \\ /\\\_\_ \_\\ /\\ \_\_\_\\ /\\ == \\ ");  System.out.println("\\ \\ \\\_\_\_\_ \\ \\ \\/\\ \\ \\ \\ \\-. \\ \\ \\ \\'/ \\ \\ \_\_\\ \\ \\ \_\_< \\/\_/\\ \\/ \\ \\ \_\_\\ \\ \\ \_\_< ");  System.out.println(" \\ \\\_\_\_\_\_\\ \\ \\\_\_\_\_\_\\ \\ \\\_\\\"\\\_ \\ \\ \\\_\_| \\ \\\_\_\_\_\_\\ \\ \\\_\\ \\\_\\ \\ \\\_\\ \\ \\\_\_\_\_\_\\ \\ \\\_\\ \\\_\\ ");  System.out.println(" \\/\_\_\_\_\_/ \\/\_\_\_\_\_/ \\/\_/ \\/\_/ \\/\_/ \\/\_\_\_\_\_/ \\/\_/ /\_/ \\/\_/ \\/\_\_\_\_\_/ \\/\_/ /\_/ ");  System.out.println("\n\n");  System.out.println("Created by Jonathan Su, Feb. 2021 \n----------------------------------\nType or paste a paragraph, then press enter to translate it to Pig Latin!");  boolean run = true;  while (run) {  pigMethod();  }  }  } |