C212 Lab 2

Objectives:

- Understand different data types in Java
- Understand where to how to use Oracles Java API documentation & tutorials
- Writing Pseudocode (Always design before coding)
- Work with Variable *Declaration* vs *Initialization,*
- Assignment Statements, Operators & Java Expressions
- Type Casting
- Reading values from keyboard (Using Scanner class)

Lab Submission

Organize all java source files in one folder, compress them as a zip file and submit the zip file on Canvas. **Make sure that your submission has all the correct files** (*I suggest download your submission to verify*). Submitting incorrect files will result in loss of grade.

Note: Be sure to review the Grading Rubric and Java Coding Guidelines available on Canvas.

Lab instructions

Work on the following exercises:

1. Complete the methods in the Lab2Exercises (provided on Canvas) and answer the questions given in the file. Submit the updated version of this file on Canvas.
2. Follow the instructions given in Lab2CompoundExercises and answer the given questions. Submit the updated version of this file on Canvas.
3. Three java source files are provided on Canvas (DebugProgramOne, DebugProgramTwo, and DebugProgramThree). These files have some errors. Help us fix them and make sure that they produce the expected results. Also, remember to make comment on where you fix in the code. Each file includes appropriate instructions. *To compile each file, you can create a new Java Project and then add each file to the src.* ***Note****: In case you have any trouble, I suggest using online resources (like YouTube) which can guide you through the steps. It only takes a few seconds to create a new project and add your existing code to it.* ***Example****: For Eclipse: Create new Project -> Import Code from the File System*

4. Create a program (name your Java file as Lab2Integers) that uses the a given a letter, symbol, or character and then prints out the corresponding ASCII integer value. Initially, use the scanner to get the user input and print the appropriate Integer. Then you will also test your code to print these

   Ex) 65 90 88 97 99 117 121 39 36 38 43 125

   Here is what will help you write your program:

   You have learned about integers and the type int so far. Java can also represent uppercase letters, lowercase letters, and a considerable variety of special symbols. Every character has a corresponding integer representation. The set of characters a computer uses together with the corresponding integer representations for those characters is called that *computer's character set*. You can determine a integer's character equivalent by preceding that integer with(char), as in (char) 80. Which would be 'P'.

5. Create a program (name your Java file as Lab2Vowels) with the following method: *public static String replaceVowels(String inputString)*

   The method returns a new String replacing each vowel in the given String with the opposite letter.

   Here is how Opposite Letter works: English alphabets have 26 letters (A to Z). A is the 1st and its opposite will be 26th (i.e., Z is the first from the end). You will replace A with Z. Similarly, E is the 5th letter from the start, and it will be replaced with fifth letter from the end (i.e., V) and so on. You must not hardcode the replacement characters. Vowels may appear more than once in the same String. You should be using built-in methods of String class to find vowels and then replace them instead of using a loop. **Hint**: Get the appropriate index (or position) for a given vowel, then get the opposite letter using ASCII values, and then replace the vowel. Example: AAeEIooUu will return ZZvVRllFf.

   For this program, follow the approach given below:

   a) **Design**: Design your program by writing pseudocode (describing the steps that your program will need to perform). You can write it as comments in your Java file.

   b) **Implement**: Write the Java Code that will perform the task

Additional Notes : For Lab2Exercise or #5, please look at the API of String class (link) and understand different available methods including split, indexOf, isEmpty, length, replace, replaceAll, subString, contains, etc. Using an "if" statement and/or a "loop" **ALONG** with these available built-in methods is allowed. *I hope that you are already familiar with these statements from your earlier programming course(s). In case you need more information, you can find it (here) or (here).*

Readings and Reference Material – From Java Tutorials Language Basics

- Here is the hyperlink for Java Language Basics: https://docs.oracle.com/javase/tutorial/java/nutsandbolts/index.html
- Read the following sub sections:

  ○ Variables

  □ Primitive Data Types and Summary of Variables ○
  Operators

  □ Assignment, Arithmetic, and unary operators

  □ Equality, Relational, and Conditional Operators ○ Expressions, Statements,
  and Blocks