COP3530 Data Structures
Project#4 (Due on June 29nd by 11:59 pm)
25 points
Summer 2019

Project Description

This project is all about counting occurrences. You will be writing three programs (java files) in this project: CountOccurenceOfNumbers.java, WordsInAscending.java and CountWordsInTextfile.java

- **(Count the occurrences of numbers entered)** Write a program that reads an unspecified number of integers and finds the one that has the most occurrences. The input ends when the input is 0. For example, if you entered 2 3 40 3 5 4 –3 3320, the number 3 occurred most often. If not one but several numbers have the most occurrences, all of them should be reported. For example, since 9 and 3 appear twice in the list 9 30 3 9 3 2 4, both occurrences should be reported.

- **(Display the words in ascending order)** Revise the below program, CountOccurrenceOfWords.java and Rewrite CountOccurenceOfWords.java to display the words in **ascending order** of occurrence counts.

  (Hint: Create a class named WordOccurrence that implements the Comparable interface. The class contains two fields, word and count. The compareTo method compares the counts. For each pair in the hash set in CountOccurenceOfWords.java, create an instance of WordOccurrence and store it in an array list. Sort the array list using the Collections.sort method. What would be wrong if you stored the instances of WordOccurrence in a tree set?)

CountOccurenceOfwords.java

```
import java.util.*;
 public class CountOccurenceOfWords {
       public static void main(String[] args) {
            // Set text in a string
            String text = "Good morning. Have a good class. " +
                        "Have a good visit. Have fun!";
            // Create a TreeMap to hold words as key and count as value
            Map<String, Integer> map = new TreeMap<>();

            String[] words = text.split("[ \n\t\r.,;:!?(){");
            for (int i = 0; i < words.length; i++) {
                  String key = words[i].toLowerCase();

                  if (key.length() > 0) {
                        if (!map.containsKey(key)) {
                              map.put(key, 1);
                        }
                        else {
                              int value = map.get(key);
                              value++;
```

```
                    map.put(key, value);
                }
            }
        }
    // Get all entries into a set
    Set<Map.Entry<String, Integer>> entrySet = map.entrySet();
    // Get key and value from each entry
        for (Map.Entry<String, Integer> entry: entrySet)
            System.out.println(entry.getValue() + "\t" +
entry.getKey());
        }
    }
```

- **(Count the occurrences of words in a text file)**
  Rewrite CountOccurrenceOfWords.java to read the text from a text file. The text file is passed as a command-line argument. Words are delimited by whitespace characters, punctuation marks (, ; . : ?), quotation marks (' "), and parentheses. Count words in case-insensitive fashion (e.g., consider Good and good to be the same word). The words must start with a letter. Display the output in alphabetical order of words, with each word preceded by its occurrence count.

Deliverables:

Make sure your project folder (i.e., Lastname_P1.zip) contains:

1. Source code (i.e., .java files NOT .class files)
   - CountOccurenceOfNumbers.java
   - WordsInAscending.java
   - CountWordsInTextfile.java
2. A readme file (i.e., readme.txt) explaining how to compile and run your project. You must include brief description of your implementation (for all programs).
3. Screenshots of your output.
4. Any input files related to this project

Finally, compress your project folder and submit it on Canvas.