

1 Word and Character Statistics for a Text (5 points)

Implement a `TextStatistics` class to collect statistics for all unique words and characters in a text. The class should have two methods for that, `countWords(String)` and `countCharacters(String)`, and two methods to query word/character counts, `getWordCount(String)` and `getCharacterCount(char)`, and a `toString()` method that prints the collected statistics. Use `Map<String, Integer>` and `Map<Character, Integer>` respectively to count the occurrences of each word and character.

Write unit tests to verify your code works. Read text from a text file of your choice.

2 Iterator for Arrays (4 points)

Create a class `ArrayIterator<T>` that implements the `java.util.Iterator` interface. The only constructor should have the signature `public ArrayIterator(T[] arr)`. No copying of the array is allowed, use minimal additional memory.

Write unit tests to verify your code works.

3 Iterator for Array of Arrays (6 points)

Create a class `MultiArrayIterator<T>` that implements the `java.util.Iterator` interface. The only constructor should have the signature `public MultiArrayIterator(T[] ... arr)`. The iterator is supposed to return the elements of all the arrays in the order in which they are given. Internally, `arr` is an array (`T[][]`) of arrays (`T[]`). You can use the `ArrayIterator<T>` from the previous exercise to implement this (even twice, if you're very clever).

Write unit tests to verify your code works.