Gebze Techical University
Department of Computer Engineering
CSE 241/505
Object Oriented Programming
Fall 2016
Homework # 8
Inheritance, Generics, Collections in Java
Due date
Jan 7th 2017
No late submissions will be accepted for this HW

This HW will be very similar to HW7 but it will be in Java.

You will write a class hierarchy for bigrams (2-Gram). A bigram is a specialization of N-Gram which "is a contiguous sequence of N items from a given data sequence". For the bigram we take N=2. For example if we have a sequence of integers {1 4 6 3 7 1 4 7 2} then the number of {1 4} bigrams is 2, the number of {4 6} bigrams is 1, and the number of {3 4} bigrams is 0. Similarly, if the sequence is {qwe asd fgh sdf sdf} then the number of {qwe asd} bigrams is 1.

The java interface Bigram which will have the following methods. This class will not have any data fields.
- readFile: takes a filename as a string parameter, reads the file, calculates all the bigrams. Throws exceptions if there are problems with opening and reading the file.
- numGrams: returns the total number of bigrams calculated so far. For example, if we read an integer sequence file that contains {1 234 346 343 7234 341 434 72 234}, then numGrams() returns 8.
- numOfGrams: takes two elements as bigrams and returns the number of that bigram read so far. For example, if we read an integer sequence file that contains {1 4 6 3 7 1 4 7 2}, then numOfGrams(1,4) returns 2.
- toString prints all the bigrams and their occurences in decreasing occurency order.

You will extend 2 concrete classes from this inteface class. The first class is BigramMap, which uses Java Collections Map class to implement all the methods above. The second class is BigramDyn which does not use any standard classes or methods, it uses only Java arrays.

Write a test method that takes a Bigram reference and a file name, reads the file, runs all the member methods catches any exceptions thrown (prints the exception error on the screen)

Write your main method that takes these command line parameters

- filename: file that contains the sequence to read, there is no limit to the number of elements in the sequence.
- Data type: 1 for int, 2 for strings, 3 for doubles
- Class type: 1 for BigramMap , 2 for BigramDyn

For example: java myProg datafile 1 2 will read file name datafile that should contain integers and my program would use BigramDyn class to run all the tests. Your main method will call the test method with suitable parameters.

Notes

- We will use very similar testing data as with the HW7
- We will test your programs with many different files and other options including files with bad data.
- Your test method can not use any of the concrete classes. It will use only the interface Bigram
- You may use intermediate/extra classes in your hierarchy if it makes your code better.