Program Assignment 7

(25 points)

Assigned: Tuesday, November 13, 2018
Due: Tuesday, November 20, 2008

Purpose

This homework is to practice with Java Collection classes for implementation of multimap.

Assignment

A `Map` in Java API allows only a single value associated with a key. You are to implement a generic `MultiMap` that allows multiple values to be associated with a key. The interface is given below:

```
import java.util.Collection;
import java.util.Set;

public interface MultiMap<K,V> {
    public boolean       contains(V value);
    public Collection<V> get(K key);
    public boolean       isEmpty();
    public Set<K>        keySet();
    public void          put(K key, V value);
    public Collection<V> remove(K key);
    public V             remove(K key, V value);
    public int           size();
    public Collection<V> values();
}
```

The descriptions of the methods in the interface are given in the file `MultiMap.java`.

This assignment is to implement this interface and test your implementation with two application programs. Here is what you need to do:

1. Copy the interface `MultiMap.java` to your workspace.

2. Implement the interface using a `List` to hold multiple values associated with a key. Name the class `ListMultiMap`.

3. Copy the program `TestMultiMap.java` to your workspace, and run it to test your implementation.

4. Write an `Anagram` application (with a `main` method). Two words (strings) are anagrams if they contains exactly the same characters but different orders. That is, a word is the result of rearranging the characters of another word. for example, "eat" and "tea" are anagrams; so are "plea" and "pale".

The `Anagram` application reads a sequence of words (one word per line) from the data file `words.txt`, finds the sets of anagrams among the words, stores them in a `MultiMap`, and display those sets of anagrams with at least 3 words.

What to Submit

Submit your well-documented source code file (.java files) and the output file (a text file) on Blackboard.