

2023 Spring CSE222 Homework6 Report

In this project I created three classes named MyMap, Info and MergeSort. The program takes a string of text and preprocesses it (transforming uppercase letters to lowercase and removing non-letter characters). This preprocessed text is then used to create a MyMap object. This MyMap is first printed in its original form and then sorted using the merge sort algorithm using a MergeSort object. The sorted MyMap object is printed last.

Info class: This class stores how many times a letter occurs in the text (count) and in which words (words). This is used to store information for a letter in the MyMap structure. The methods of this class are used to set and retrieve this information.

MyMap class: This class represents a LinkedHashMap structure that stores the letters and their information from the text. The Map structure uses a letter (String) as the key and the Info object of that letter as the value. This class populates this map structure by extracting information from the text. It also has methods for setting and retrieving the map structure and its size.

MergeSort class: This class is used to sort a MyMap structure. Using the MergeSort algorithm, this sorts letters according to how often they occur in the text (i.e. the "count" values of Info objects). The class takes a MyMap structure and returns an ordered MyMap structure.

Main class: This class is the main entry point of the program. It takes the text, preprocesses it (converts uppercase letters to lowercase and removes non-letter characters), creates a MyMap structure, prints it, sorts this MyMap structure, and prints the result again.

Specifically, the createMap method in the MyMap class breaks down the text and adds each letter and which word it is in to the map structure. The mergeSort and merge methods in the MergeSort class are used to sort a map structure.

Running Command and Test

ubuntu@ubuntu-virtual-machine:~/Masaüstü/homework6\$ javac *.java

ubuntu@ubuntu-virtual-machine:~/Masaüstü/homework6\$ java Main

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ubuntu@ubuntu-virtual-machine:~/Masaüstü/homework6$ javac *.java
ubuntu@ubuntu-virtual-machine:~/Masaüstü/homework6$ java Main
Original String:    Buzzing bees buzz.
Preprocessed String:  buzzing bees buzz

The original (unsorted) map:
Letter: b - Count: 3 - Words: [buzzing, bees, buzz]
Letter: u - Count: 2 - Words: [buzzing, buzz]
Letter: z - Count: 4 - Words: [buzzing, buzzing, buzz, buzz]
Letter: i - Count: 1 - Words: [buzzing]
Letter: n - Count: 1 - Words: [buzzing]
Letter: g - Count: 1 - Words: [buzzing]
Letter: e - Count: 2 - Words: [bees, bees]
Letter: s - Count: 1 - Words: [bees]

The sorted map:
Letter: i - Count: 1 - Words: [buzzing]
Letter: n - Count: 1 - Words: [buzzing]
Letter: g - Count: 1 - Words: [buzzing]
Letter: s - Count: 1 - Words: [bees]
Letter: u - Count: 2 - Words: [buzzing, buzz]
Letter: e - Count: 2 - Words: [bees, bees]
Letter: b - Count: 3 - Words: [buzzing, bees, buzz]
Letter: z - Count: 4 - Words: [buzzing, buzzing, buzz, buzz]
ubuntu@ubuntu-virtual-machine:~/Masaüstü/homework6$
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ubuntu@ubuntu-virtual-machine:~/Masaüstü/homework6$  
ubuntu@ubuntu-virtual-machine:~/Masaüstü/homework6$ javac *.java  
ubuntu@ubuntu-virtual-machine:~/Masaüstü/homework6$ java Main  
Original String: 'Hush, hush!' whispered the rushing wind.  
Preprocessed String: hush hush whispered the rushing wind  
  
The original (unsorted) map:  
Letter: h - Count: 7 - Words: [hush, hush, hush, hush, whispered, the, rushing]  
Letter: u - Count: 3 - Words: [hush, hush, rushing]  
Letter: s - Count: 4 - Words: [hush, hush, whispered, rushing]  
Letter: w - Count: 2 - Words: [whispered, wind]  
Letter: i - Count: 3 - Words: [whispered, rushing, wind]  
Letter: p - Count: 1 - Words: [whispered]  
Letter: e - Count: 3 - Words: [whispered, whispered, the]  
Letter: r - Count: 2 - Words: [whispered, rushing]  
Letter: d - Count: 2 - Words: [whispered, wind]  
Letter: t - Count: 1 - Words: [the]  
Letter: n - Count: 2 - Words: [rushing, wind]  
Letter: g - Count: 1 - Words: [rushing]  
  
The sorted map:  
Letter: p - Count: 1 - Words: [whispered]  
Letter: t - Count: 1 - Words: [the]  
Letter: g - Count: 1 - Words: [rushing]  
Letter: w - Count: 2 - Words: [whispered, wind]  
Letter: r - Count: 2 - Words: [whispered, rushing]  
Letter: d - Count: 2 - Words: [whispered, wind]  
Letter: n - Count: 2 - Words: [rushing, wind]  
  
Letter: u - Count: 3 - Words: [hush, hush, rushing]  
Letter: i - Count: 3 - Words: [whispered, rushing, wind]  
Letter: e - Count: 3 - Words: [whispered, whispered, the]  
Letter: s - Count: 4 - Words: [hush, hush, whispered, rushing]  
Letter: h - Count: 7 - Words: [hush, hush, hush, hush, whispered, the, rushing]  
ubuntu@ubuntu-virtual-machine:~/Masaüstü/homework6$
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