DATA STRUCTURES REPORT

Course Work 1

Hash Table and Linked List Based Map Implementations

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System’s Design

The program was given to us as a capability to read word by word, and multiple files. The main interfaces necessary for the execution of this program where read to implement some of the class where already implemented and the Word index file is partially implemented. The object word is used where reading the files to allow world manipulation it holds a position and its respective word string.

ListWordMap.java

In this class I used a predefined arraylist class to design HashMap.

1. I created addPos method to add the position &words in the map

2. I created removePos method to remove the position in the map having the word and position supplied as arguments

3. I created removeWord method to remove the words in the map having the word as argument

4. I created positions method to get the positions in the map

5. I created a method words to get the words in the map.

WordPosition.java

In this class I am representing position of the given map. here we are placing the getter methods for all the fields, and a method for comparing two positions.

HashWordMap.java

1. In this class I implemented a map by using double hashing mechanism.

2. In this I created methods for load Factor and maxLoadFactor's.

3. I also create a method for getting average number of probes.

4. I create a method to get the number of elements in the map.

5. I create a method to add entire to the map (addPos(words, position))

in this method we check the hash1 index is available or not if it was available, I add the entry in that index itself, otherwise we add hash2 to hash1 and check once again the index is available or not and so on. Once the index is available, we add the element in the index.

6. I create a method for removing position on that method we generate the hash code for the word and check with that index the word with the position is available or not if it was available, we remove the element otherwise we throw the Word Exception.

7. I create a method to get all the words in the map on that we iterate on the array add the word to a list if it was not there in the list and finally, we return the iterator of the list what we are related.

8. I create a method to return positions of the HashMap on that method we iterate the entire HashMap and add the positions to a list and we return the iterator of the list.

9. I created a method remove word method to remove the word in the collection in this method we create the hash code of the word and check the hash code related indexes in the array if it was available, I removed it.

Word Exception.java

In the class we are creating one exception class that will be thrown when the word is not found in the collection.

WordIndex.java

In this class we use on switch case to add all files words to the map or add only one file data to the map. After that we want to find a word in the map, we remove a word from the map we print the map details.