Assignment 6 Written

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1. **Given an example of two words that would hash to the same value using hashFunction1 but would not using hashFunction2.**

   Example of two words could be “net, and ten”.

2. **Why does the above observation make hashFunction2 superior to hashFunction1?**

   As long as the word is composed of same letters then hashFunction1 returns the same value, which means the chance of returning the same value would be higher with hashFunction1 rather than hashFunction2. When we talk about hash function, we can refer the function like hashFunction2 returning more various different values and making links more distributed is superior to other function like function hashFunction1.

3. **When you run your program on the same input file once with hashFunction1 and once with hashFunction2, is it possible for your hashMapSize function to return different values?**

   No, because hashMapSize function returns the total number of links stored in the hashmap, the total number does not change even if we use different hash function.

4. **When you run your program on the same input file once with hashFunction1 and once with hashFunction2, is it possible for your hashMapTableLoad function to return different values?**

   No, hashMapTableLoad returns the load factor of the hash map. Load factor of each hash map does not change even if we use different hash function.

5. **When you run your program on the same input file once with hashFunction1 an once with hashFunction2, is it possible for your hashMapEmptyBuckets function to return different values?**

   Yes, hashMapEmptyBuckets returns the number of buckets which is not filled with any link. The bucket which one link will be stored is so dependent on the index value newly made by a hash function with the key value. So as hash function differs the result of index value changes as well. So it is possible for my hashMapEmptyBuckets function to return different values.

6. **Is there any difference in the number of empty buckets when you change the table size from an even number like 1000 to a prime like 997?**

   Yes, We are recommended to use prime number like 997 to avoid values cluster into few number of buckets instead of other numbers. So If change the table size from an even number like 1000 to a prime then there will be differences in the number of empty buckets.