

Assignment 6 Questions

1. Give an example of two words that would hash to the same value using `stringHash1()` but would not using `stringHash2()`.

- a. `drumer` & `murder` – `stringHash1()` gives 4 for both. But `stringHash2(drumer) == 4` & `stringHash2(murder) == 5`

2. Why does the above make `stringHash2()` superior to `stringHash1()`?

- a. Assures that a word of the same size and similar set of letters will hash out to a different value.

3. When you run your program on the same input file but one run using `stringHash1()` and on the other run using `stringHash2()`. Is it possible for your `size()` function to return different values?

- a. Yes, even on the trivial set above `stringHash1()` would produce `size == 1`, and `stringHash2()` would produce `size == 2`.

4. When you run your program on the same input file using `stringHash1()` on one run and using `stringHash2()` on another, is it possible for your `tableLoad()` function to return different values?

- a. No, the load factor is a ratio of two constants (input file word count) / table size.

5. When you run your program on the same input file with one run using `stringHash1()` and the other run using `stringHash2()`, is it possible for your `emptyBuckets()` function to return different values?

- a. Yes, in the trivial case above `stringHash1()` would have $(\text{TableSize} - 1)$ empty buckets, and `stringHash2()` would have $(\text{TableSize} - 2)$ empty buckets.

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?

- a. Yes, you changed the maximum number of empty buckets available from the first iteration with no data in the table. From there iteration 1 would give you two different values for the empty buckets.

7. Using the timing code provided to you. Run your code on different size hash tables. How does affecting the hash table size change your performance?

- a. Makes the runtime grow looks like in a linear fashion, then it grows at a smaller rate as you increase the size of the table beyond the number of elements in your input file.