CS2302 - Data Structures

Spring 2020

Exam # 2 - Hash Tables

1. The function *same_hash_as_k(h,k)* receives a hash table h and a key k and returns a list of the keys that have the same hash value as k. However, the function does not work, always returning an empty list. Fix it so it produces the same results in $O(1)$ time.

2. Write the function *difference(L1,L2)* that receives lists *L1* and *L2* and returns the items that appear in *L1* but not in *L2* (that is, *L1 - L2*). Use hash tables with chaining so your function runs in $O(n)$ time, where n = *len(L1) + len(L2)*. You may assume that neither list contains duplicates. Note: you will receive no credit if you don't use our implementation of hash tables with chaining or if your function does not run in the required time.

3. Write the function *reversed_pairs(L)* that receives a list of strings L and returns a list of strings L_r containing all the words that are in L and whose reverses are also in L. For example, if L=['the','rats','are','looking','at','a',star'] your function should return ['a', 'rats', 'star']. Use hash tables with chaining so your function runs in $O(n)$ time. Hint: recall that the reverse of string s is *s[::-1]*.