

## EL9343 Homework 7

(Due Nov 12<sup>th</sup>, 2021)

No late submission accepted

*All problem/exercise numbers are for the third edition of CLRS text book*

1. Suppose that we wish to implement a dynamic, open-address hash table. Why might we consider the table to be full when its load factor reaches some value  $\alpha$  that is strictly less than 1? Describe briefly how to make insertion into a dynamic, open-address hash table run in such a way that the expected value of the amortized cost per insertion is  $O(1)$ . Why is the expected value of the actual cost per insertion not necessarily  $O(1)$  for all insertions? (Exercise 17.4-1 in CLRS Textbook, page 471)
2. Write pseudocode for RIGHT-ROTATE. (Exercise 13.2-1 in CLRS Textbook, page 313)
3. Demonstrate what happens when we insert the keys [5, 28, 19, 15, 20, 33, 12, 17, 10] into a hash table with collisions resolved by chaining. Let the table have 9 slots and let the hash function be  $h(k) = k \bmod 9$ .

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2	
3	
4	
5	
6	
7	
8	

4. Building an AVL Tree out of the Binary Search Tree according to the rotation operations in the lecture. (You can simply give the final result.)

```
      5
     /\
    3  8
     /\
    7  9
     /\
    6 10
```