Homework #6

1. (10 points) Complete the non-optional exercises from the Hashing Lab (Nov. 19) and submit your `hash_map.py` file on WebCAT.

2. (3 points) Assume an initially empty hash table with 11 entries in which the hash function uses the division method. Show the contents of the hash table after the following keys are inserted (in the order listed), assuming the indicated type of probe is used: 56, 133, 45, 92, 197, 43, 247. [1]

Use the following hash function: $h(x) = x \bmod 11$

(a) Linear probe (with a step of 1)

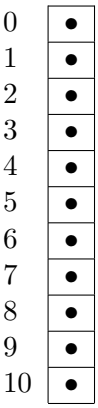
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

(b) Double hashing (with $h'(k) = 1 + (k * 3) \% 7$)

0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

[1] This is a modified version of question 11.1 from *Data Structures and Algorithms Using Python*, Rance Necaise, 2011.

(c) Separate chaining (draw chains to the right of the table)



3. (2 points) Add the following keys to an initially empty, non-self balancing, binary search tree: 4, 13, 21, 10, 7, 6, 18, 15.

4. (5 points) Repeat the previous exercise for an AVL tree. Add the following keys in order: 4, 13, 21, 10, 7, 6, 18, 15. **Show every intermediate step!**

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