CSE 373 Lecture 13 In-Class Worksheet — Fall 2018

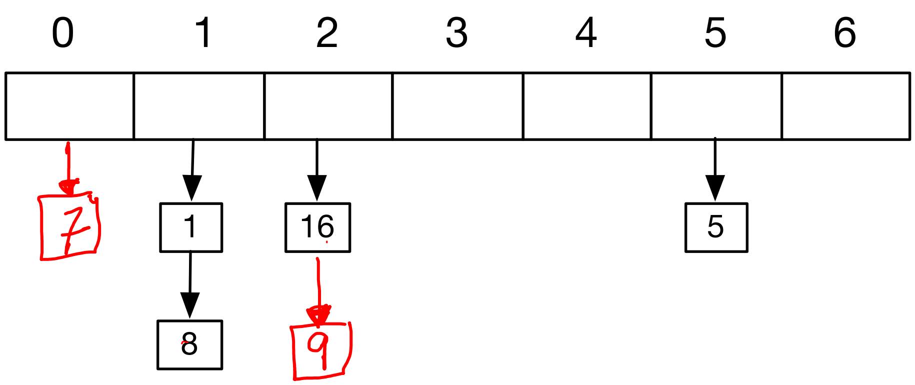
Name: ____ Date: ____________________

UW Student #: ______________ UW Email address: ________________________________

Partner name(s) for this activity: ____

Will you want to pick up your worksheet later? Circle one: Yes / No

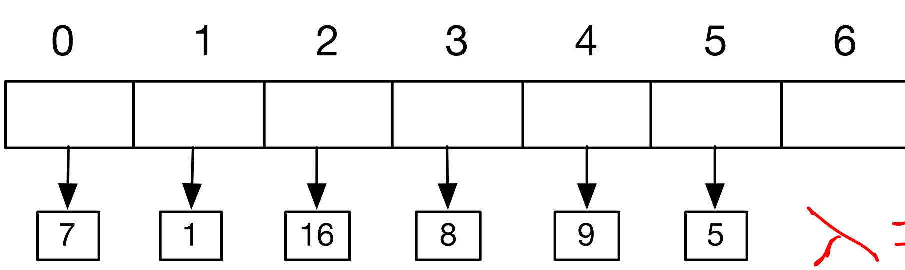
Q1) The following table shows the resulting hash table after inserting keys 1, 16, 8, and 5. The hash table uses the hash function h(x) = x % 7 and separate chaining to avoid collisions. Now suppose **we insert keys 7 and 9** in this hash table. What would the resulting hash table look like (show where the values would be inserted).



(Q2) What is the load factor of the resulting hash table in (Q3)

$$\text{Load factor } \lambda = \frac{\text{num of entries in table}}{\text{Table size}} = \frac{n}{c} = \frac{6}{7}$$

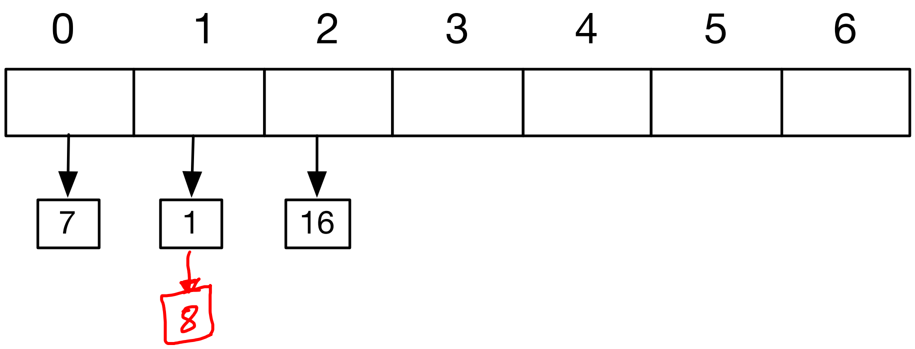
(Q3) What is the load factor of the following hash table?



$$\lambda = \frac{n}{c} = \frac{6}{7}$$

(Q4) Each table uses the hash function h(x) = x % 7, but different collision handling strategies. **Show where key 8 will be inserted** in the following hash tables.

(4a) The following hash tables uses separate chaining



(4b) The following hash tables uses open addressing with linear probing

$h(8) = 1 + 0$
$= 1 + 1 = 2$
$= 1 + 2 = 3$

0	1	2	3	4	5	6
7	1	16	8			

(4c) The following hash tables uses open addressing with quadratic probing.

$h(8) = 1 + 0$
$= 1 + 1^2 = 2$
$= 1 + 2^2 = 5$

0	1	2	3	4	5	6
7	1	16			8	

(Q5) What is the worst case tight-O for the following operations:

(5a) Insert in a separate chaining hash table: $O(n)$

(5b) Insert in an open addressing hash table that uses linear probing to resolve collisions: $O(n)$

(5c) Find in a separate chaining hash table: $O(n)$

(5d) Find in an open addressing hash table that uses linear probing to resolve collisions: $O(n)$