100225498 7   Neel Katrodiya   HW-9

11.2-2 Let the table have a slots and let the hash function be

$$h(k) = k \bmod 9$$

Key: 5
$$h(5) = 5 \bmod 9 = 5$$
Insert 5 into slot 5.

key: 28
$$h(28) = 28 \bmod 9 = 1$$
Insert 28 into slot 1.

key: 19
$$h(19) = 19 \bmod 9 = 1$$
Insert 19 into slot 1 and chain with 28

key: 15
$$h(15) = 15 \bmod 9 = 6$$
Insert 15 into slot 6

key: 20
$$h(20) = 20 \bmod 9 = 2$$
Insert 20 into slot 2

key: 33

$$h(33) = 33 \bmod 9 = 6$$

Insert 33 into slot 6 and chain with 15

key: 12

$$h(12) = 12 \bmod 9 = 3$$

Insert 12 into slot 3

key: 17

$$h(17) = 17 \bmod 9 = 8$$

Insert 17 into slot 8.

key: 10

$$h(10) = 10 \bmod 9 = 1$$

Insert 10 into slot 1 (chain with 28 and 19)

Final hash table with chains:

slot	values
0	
1	28 → 19 → 10
2	20
3	12
4	
5	5
6	15 → 33
7	
8	17

Each slot contains either one key or a chain
of keys that hashed to the same slot, the
collisions are resolved by chaining,
where keys that hash to the same index
are linked together in a list.

11.3-1 We will check if the hashvalue of the node
in the linked list and, in addition, if
it disagrees. This can increase the
runtime by a factor proportional to the
length of the long character strings.

— Compute the hash of the target key, first
compute the hash value $h(k')$ of the key
k' that you are searching for using the
same hash function that was used to
store the hash values in the linked list.

11.4-1 $10, 22, 31, 4, 15, 28, 17, 88, 59$ keyas are given.

insert these keys into hash table.

length $m = 11$, $h'(k) = k$
$c_1 = 1$, $c_2 = 3$ $h_1(k) = k$

$h_2(k) = 1 + (k \bmod (m-1))$

$h_2(k,i) = (k+i) \bmod 11$

$h(10,0) = 10 \bmod 11 = 10$

$h(22,0) = 22 \bmod 11 = 0$

$h(31,0) = 31 \bmod 11 = 9$

$h(4,0) = 4 \bmod 11 = 4$

$h(15,0) = 15 \bmod 11 = 4$

$h(15,1) = (15+1) \bmod 11 = 5$

$h(28,0) = 28 \bmod 11 = 6$

$h(17,0) = 17 \bmod 11 = 6$

$h(17,1) = (17+1) \bmod 11 = 7$

$h(88,0) = 88 \bmod 11 = 0$

$h(88,1) = (88+1) \bmod 11 = 1$

$h(59,0) = 59 \bmod 11 = 4$

$h(59,1) = (59+1) \bmod 11 = 5$

$h(59,2) = (59+2) \bmod 11 = 6$

$h(59,3) = (59+3) \bmod 11 = 7$

$h(59,4) = (59+4) \bmod 11 = 8$

Representing the obtained values into table we get us.

$h(k, i) =$ $(k+i) \bmod 11$	T0	T1	T2	T3	T4	T5	T6	T7	T8
0		22	22	22	22	22	22	22	22
1							88	88	88
2									
3									
4				4	4	4	4	4	4
5					15	15	15	15	15
6						28	28	28	28
7							17	17	17
8									59
9			31	31	31	31	31	31	31
10	10	10	10	10	10	10	10	10	10