CS501
Mansi Shah(19526)
Week 11 Homework 11

Q-2 use Separate chaining to insert to following numbers to a hash table of size 10.

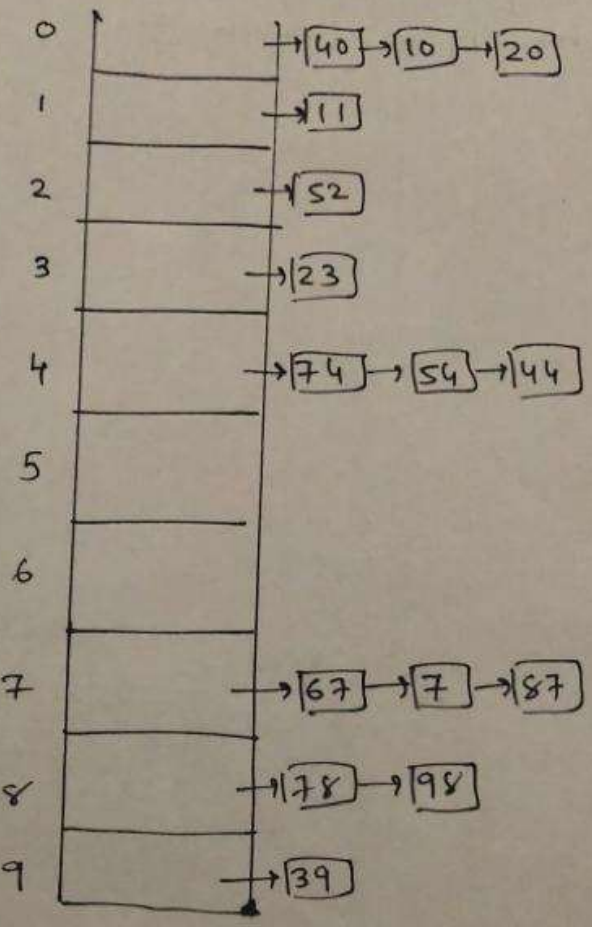
67 39 40 74 10 54 20 7 87 52 44 23
11 78 98

Step 1: Store data

Hash table size = 10

Index

67 % 10 = 7
39 % 10 = 9
40 % 10 = 0
74 % 10 = 4
10 % 10 = 0
54 % 10 = 4
20 % 10 = 0
7 % 10 = 7
87 % 10 = 7
52 % 10 = 2
44 % 10 = 4
23 % 10 = 3
11 % 10 = 1
78 % 10 = 8
98 % 10 = 8



Step 2: Searching 23

23 % 10 = 3 (get from bucket 3)

Required only 1 step to find 23.

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Q-3 please use linear probing to insert the Following numbers to a hash table.

67 39 40 74 10 54 20 7 87 52 44 23 11 78 98

Table size = equal or greater than a key = 15

Step 1: Store data

67 % 15 = 7
39 % 15 = 9
40 % 15 = 10
74 % 15 = 14
10 % 15 = 10
54 % 15 = 9
20 % 15 = 5
7 % 15 = 7
87 % 15 = 12
52 % 15 = 7
44 % 15 = 14
23 % 15 = 8
11 % 15 = 11
78 % 15 = 3
98 % 15 = 8

0	52
1	44
2	23
3	11
4	78
5	20
6	98
7	67
8	7
9	39
10	40
11	10
12	54
13	87
14	74

Initial Hash table

Step 2: Search 23

23 % 15 = 8

10 steps required to find 23

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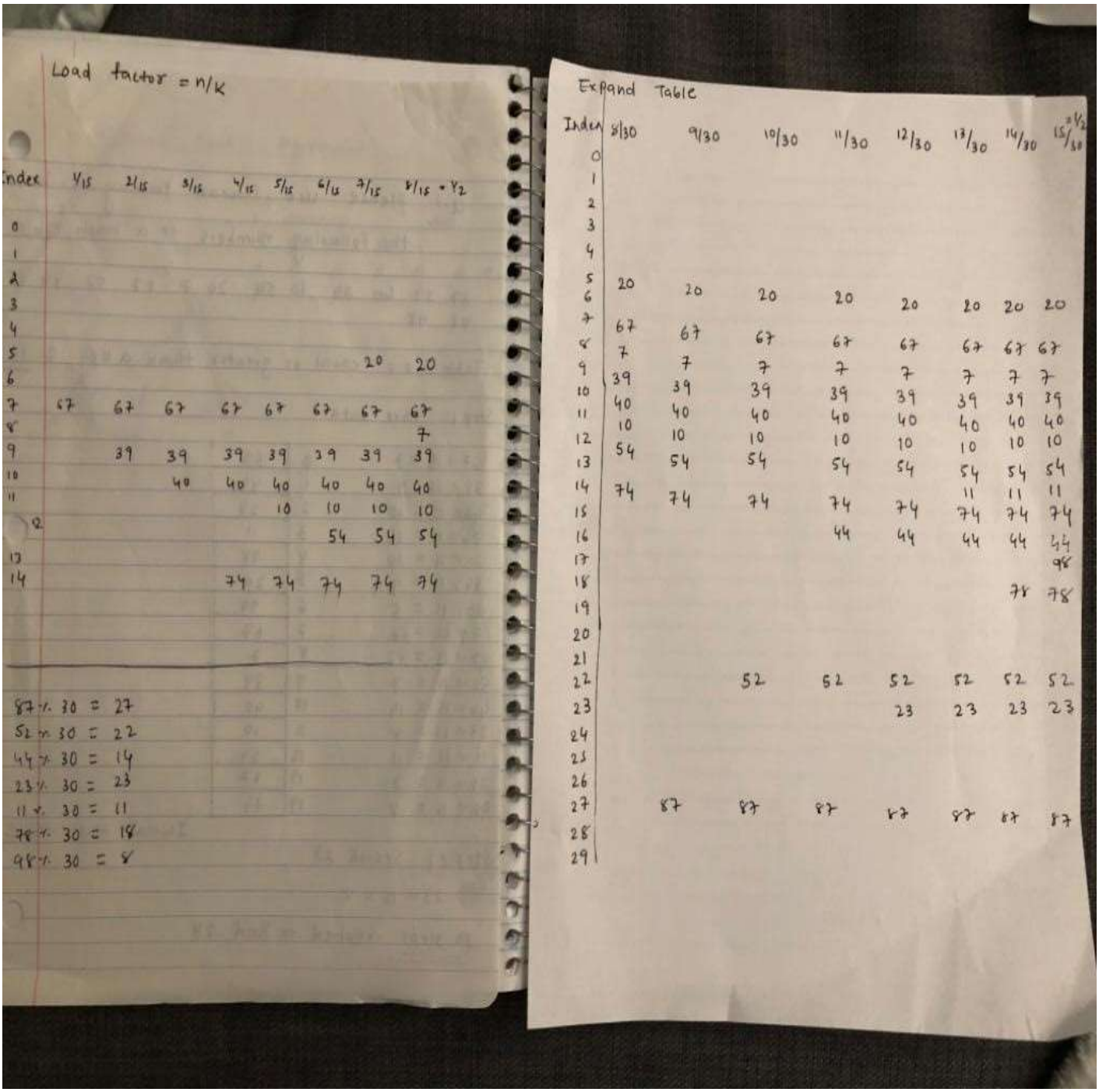

Load factor = n/k

Index	1/15	2/15	3/15	4/15	5/15	6/15	7/15	8/15 = 1/2
0								
1								
2								
3								
4								
5							20	20
6								
7	67	67	67	67	67	67	67	67
8								7
9		39	39	39	39	39	39	39
10			40	40	40	40	40	40
11					10	10	10	10
12						54	54	54
13								
14				74	74	74	74	74

87 % 30 = 27
52 % 30 = 22
44 % 30 = 14
23 % 30 = 23
11 % 30 = 11
78 % 30 = 18
98 % 30 = 8

Expand Table

Index	8/30	9/30	10/30	11/30	12/30	13/30	14/30	15/30 = 1/2
0								
1								
2								
3								
4								
5								
6	20	20	20	20	20	20	20	20
7								
8	67	67	67	67	67	67	67	67
9	7	7	7	7	7	7	7	7
10	39	39	39	39	39	39	39	39
11	40	40	40	40	40	40	40	40
12	10	10	10	10	10	10	10	10
13	54	54	54	54	54	54	54	54
14	74	74	74	74	74	11	11	11
15						74	74	74
16				44	44	44	44	44
17								98
18							78	78
19								
20								
21								
22			52	52	52	52	52	52
23					23	23	23	23
24								
25								
26								
27		87	87	87	87	87	87	87
28								
29								