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Homework - ch 11B

11.6) Suppose that we are using extendable hashing on a file that contains records with following search-key values:

2, 3, 5, 7, 11, 17, 19, 23, 29, 31

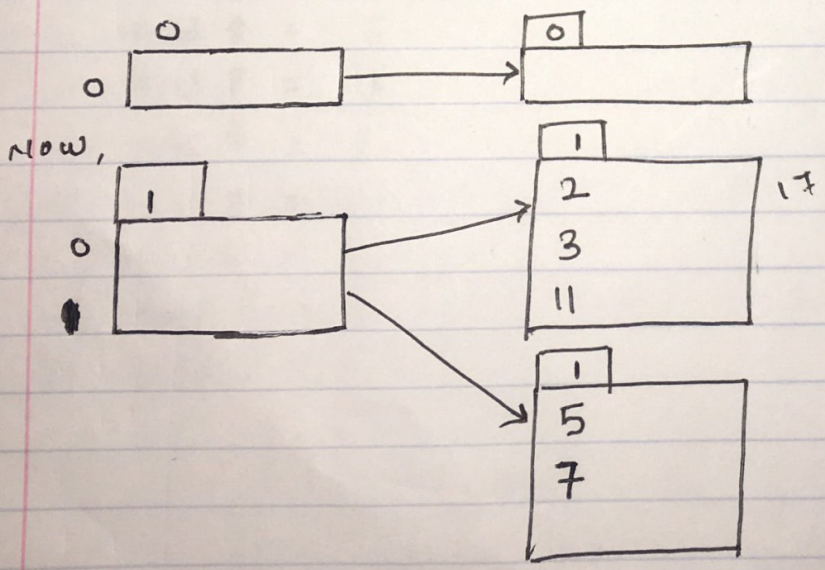
Show the extendable hash structure for this file if the hash function is $h(x) = x \bmod 8$ & buckets can hold three records.

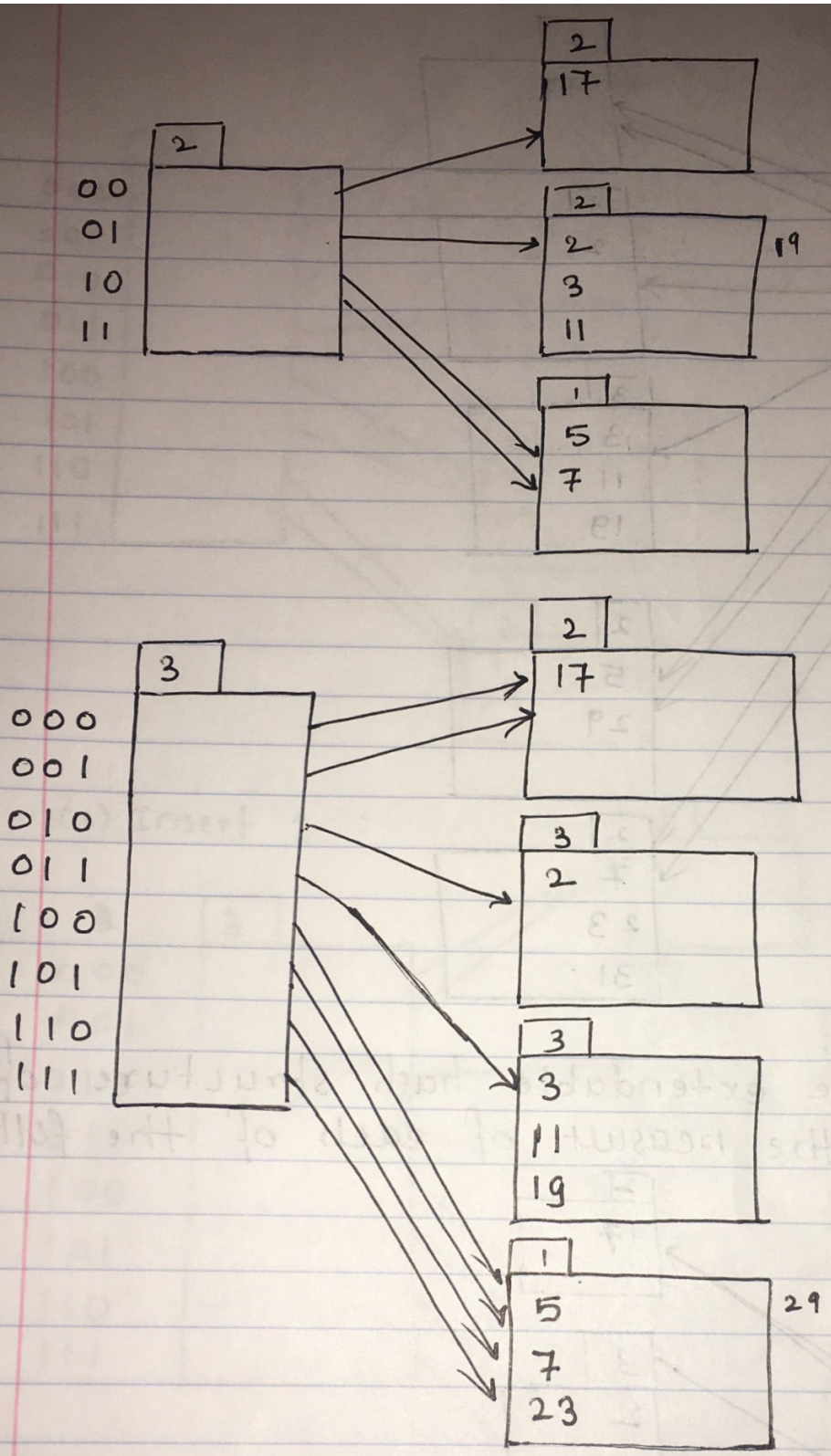
→

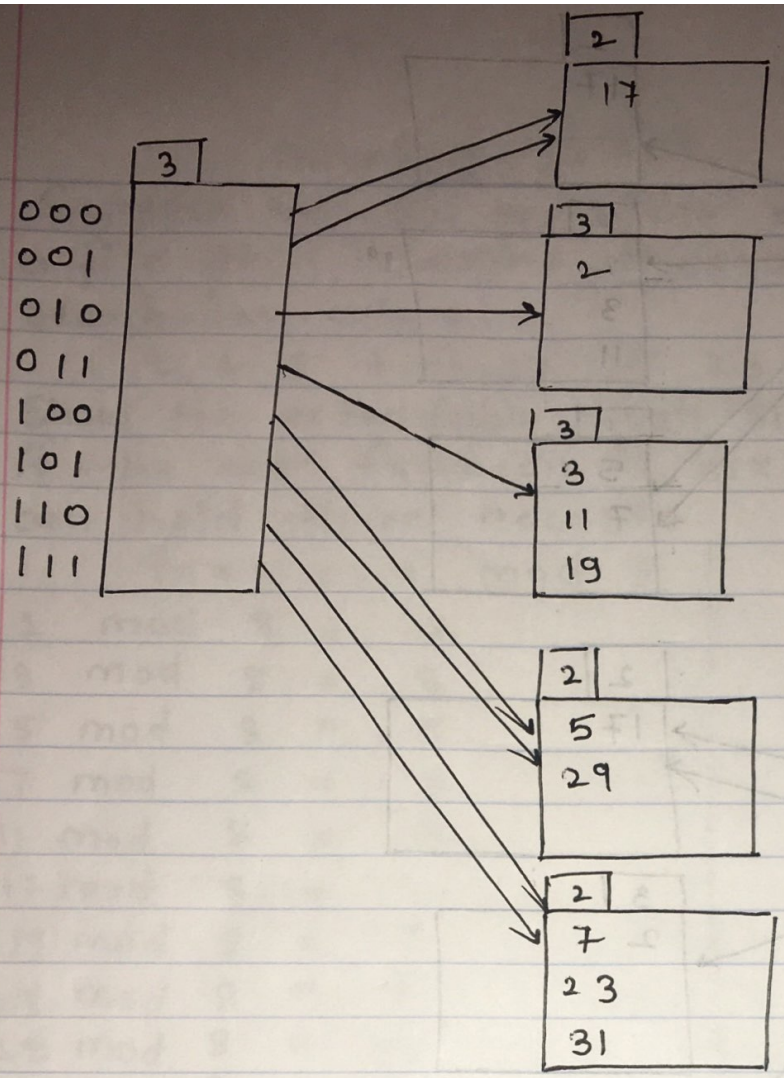
$h(x) = x \bmod 8$
$2 \bmod 8 = 2$
$3 \bmod 8 = 3$
$5 \bmod 8 = 5$
$7 \bmod 8 = 7$
$11 \bmod 8 = 3$
$17 \bmod 8 = 1$
$19 \bmod 8 = 3$
$23 \bmod 8 = 7$
$29 \bmod 8 = 5$
$31 \bmod 8 = 7$

Decimal	Binary
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

initial hash structure :-

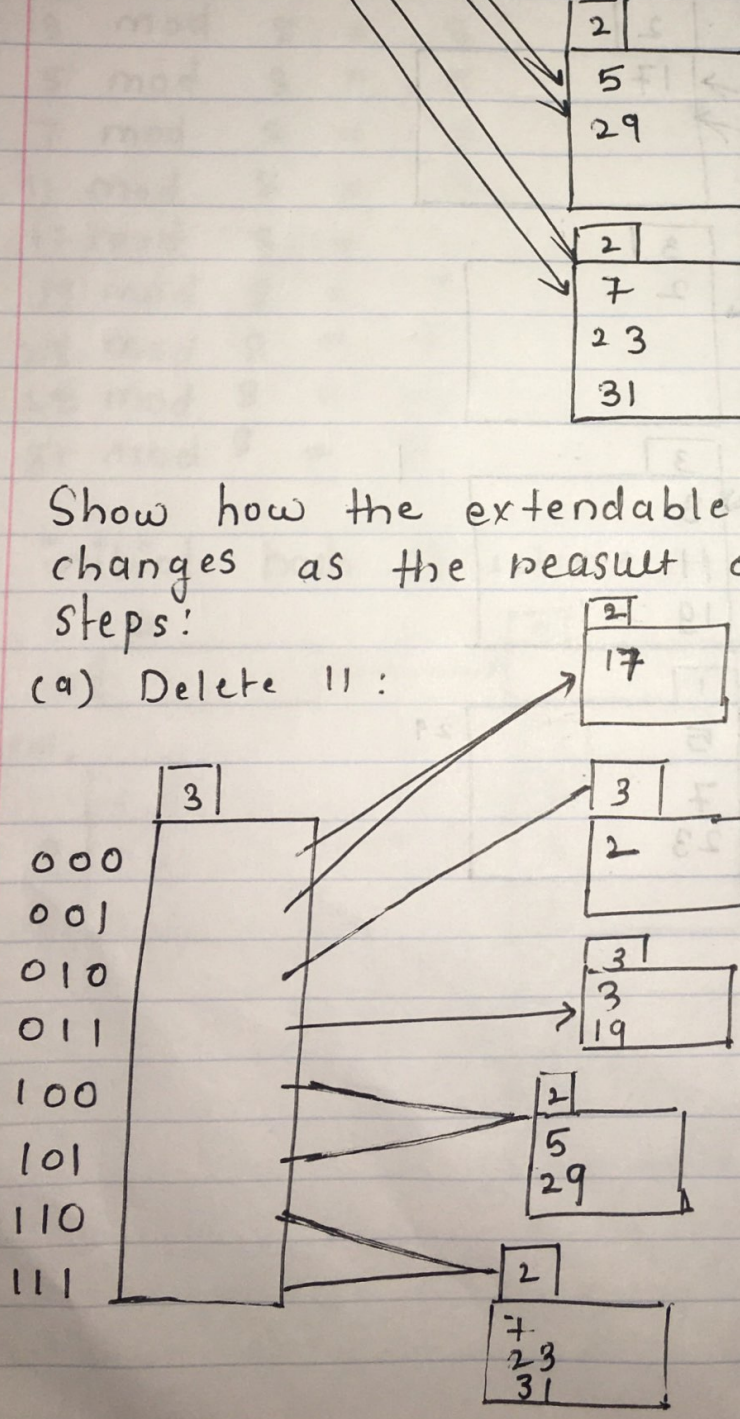




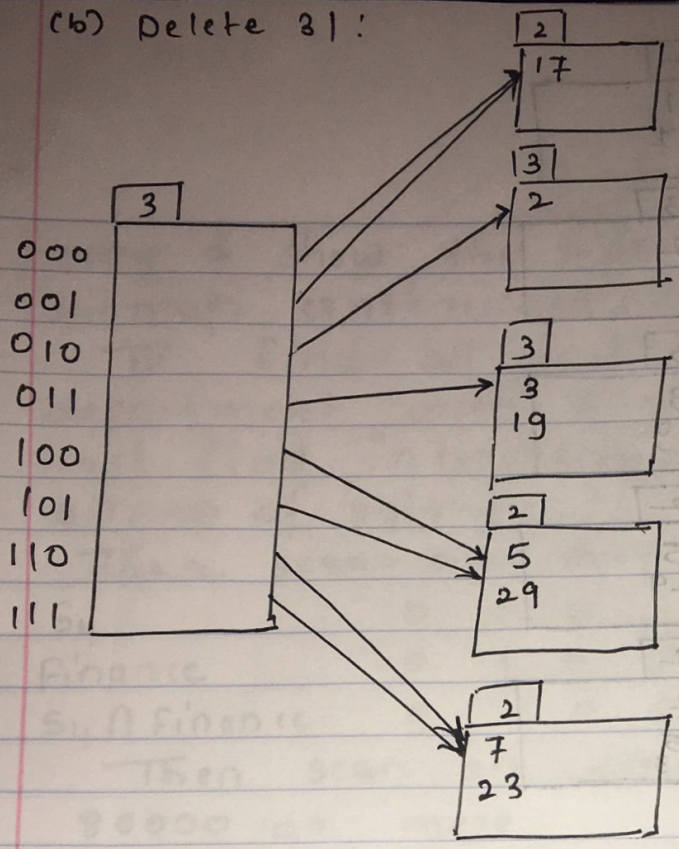


17) Show how the extendable hash structure of Q. 11 changes as the result of each of the following steps:

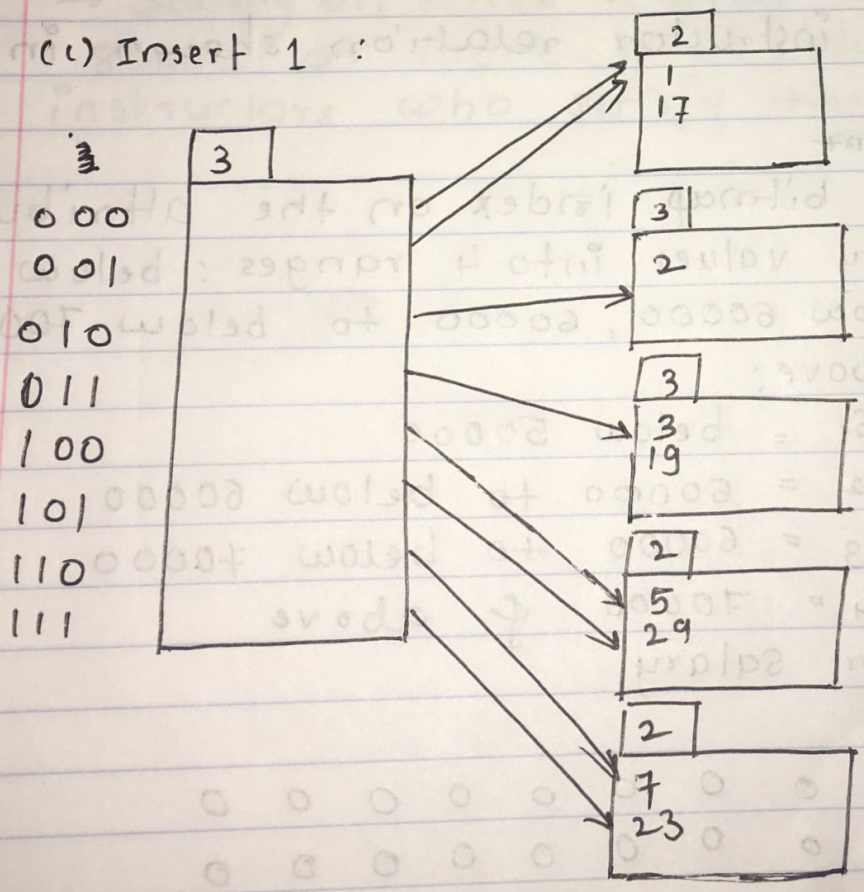
(a) Delete 11 :



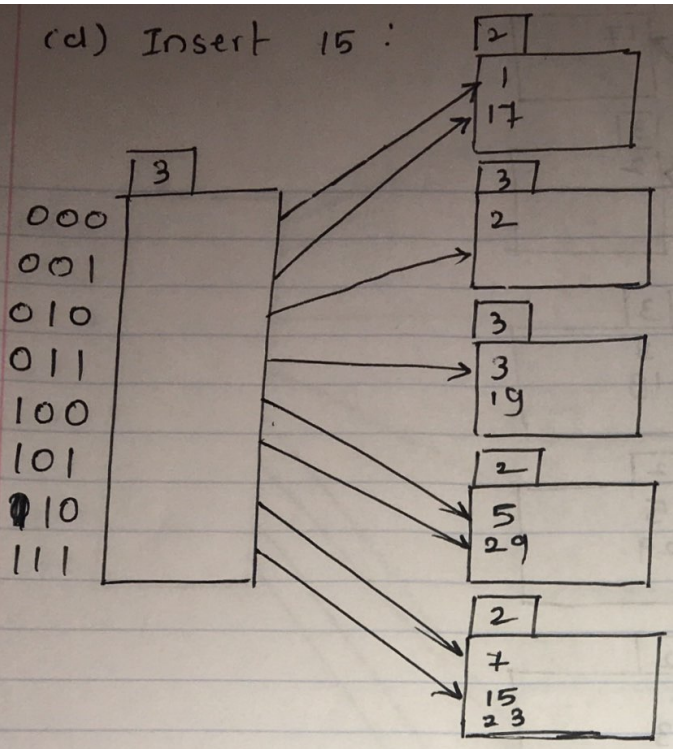
(b) Delete 31 :



(c) Insert 1 :



(d) Insert 15 :



11.11) Consider the instructor relation shown in fig 11.1

→ ~~ED~~ ~~name~~

(a) Construct a bitmap index on the attribute salary, dividing salary values into 4 ranges : below 50000, 50000 to below 60000, 60000 to below 70000 & 70000 & above:

→ consider, S_1 = below 50000
S_2 = 50000 to below 60000
S_3 = 60000 to below 70000
S_4 = 70000 & above

∴ Bitmap for salary

S_1	0	0	1	0	0	0	0	0	0	0	0	0	0
S_2	0	0	0	0	0	0	0	0	0	0	0	0	0
S_3	1	0	0	0	1	0	0	1	0	0	0	0	0
S_4	0	1	0	1	0	1	1	0	1	1	1	1	1

(b) Consider a query that requests all instructors in the finance department with salary of 80000 or more. Outline the steps in the answering the

query & show the final & intermediate bitmaps constructed to answer the query.

→ To find all instructors in the Finance department with salary 80000 or more, we first find intersection of finance dept. & S_4 bitmap of salary.

~~Then scan on thes~~

S_4	0	1	0	1	0	1	1	0	1	1	1	1
Finance	0	1	0	0	0	0	0	0	1	0	0	0
$S_4 \cap$ Finance	0	1	0	0	0	0	0	0	1	0	0	0

Then scan on these records for salary 80000 or more.

→ Scaning on these records with salary 80000 or more gives Wu & Singh as the instructors who satisfy the given query.