CS3563: DBMS - II

Assignment No. 3

Name - T. Vijay
Roll no - CS17BTECH11040

Q1 a) Size of each track in cylinder

$= 512 \times 512$ Bytes

$\therefore$ Size of disk $= 4 \times 2 \times 8192 \times 512 \times 512$

$= 16$ GiB

b) Given : Size of file = 100MiB

Assumptions : As head switch time is not mentioned, we wont use other platters.

So moving to other recording surfaces is not considered, (assuming ~~ted~~ head switch time to be high)

Also, we assume that disk controller can't read data efficiently from the middle

∴ No of tracks required

= 1000 * 1024 * 1024 ÷ 512 ÷ 512

= 4000 tracks

So start writing the file in a contiguous matter from <3, 4096, 0> to <3, 8095, 511>

c) Given Average seek time = 5 ms

Speed of spindle of disk = 7200 RPM = 120 rev/sec

Assumption: Each seek requires 5ms

∴ Time = 4000×5 ms + $4000 \times \frac{1000}{120}$

= 53333.$\bar{3}$ ms

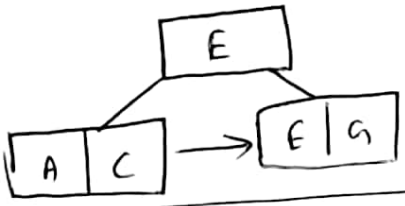
= 53.$\bar{3}$ sec

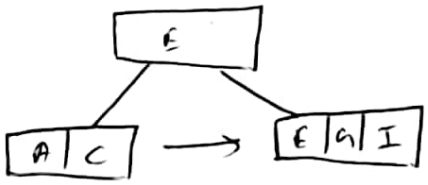
d) a) 35185 track-widths

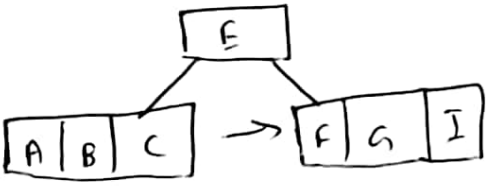
b) Only one swoop is required from 8095 to 5.

∴ 8090 track widths

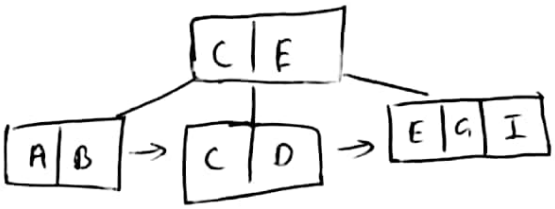
Q2 a)



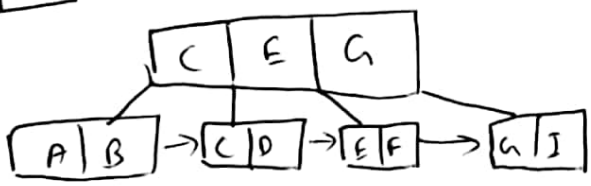


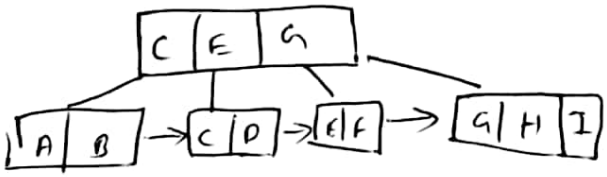


Split

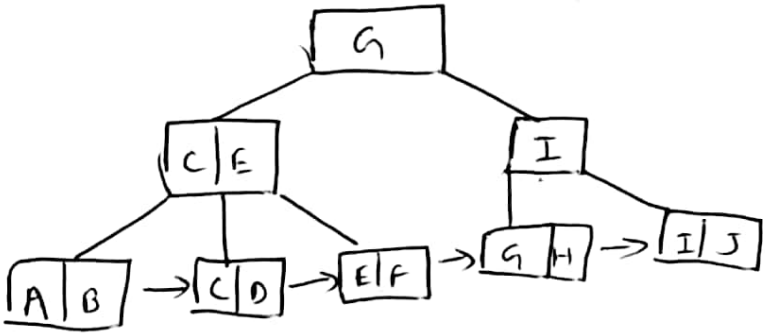


Split

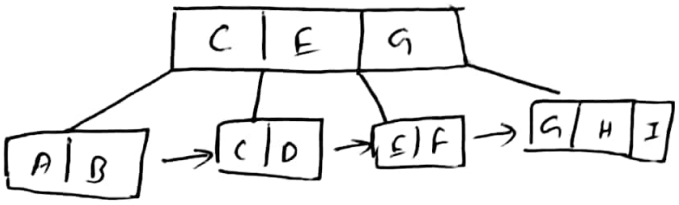




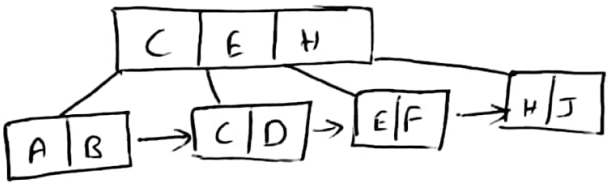
2 Splits



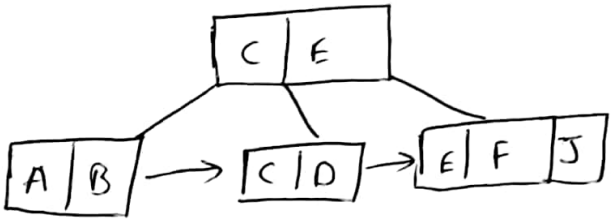
b) After Deleting I:



After Deleting G:



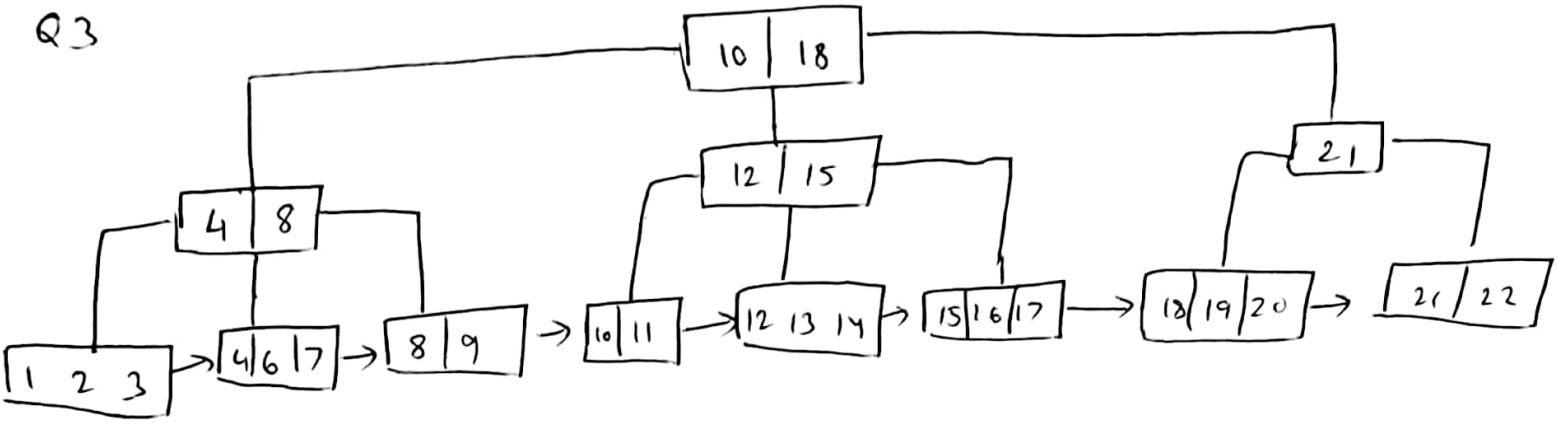
After deleting H:



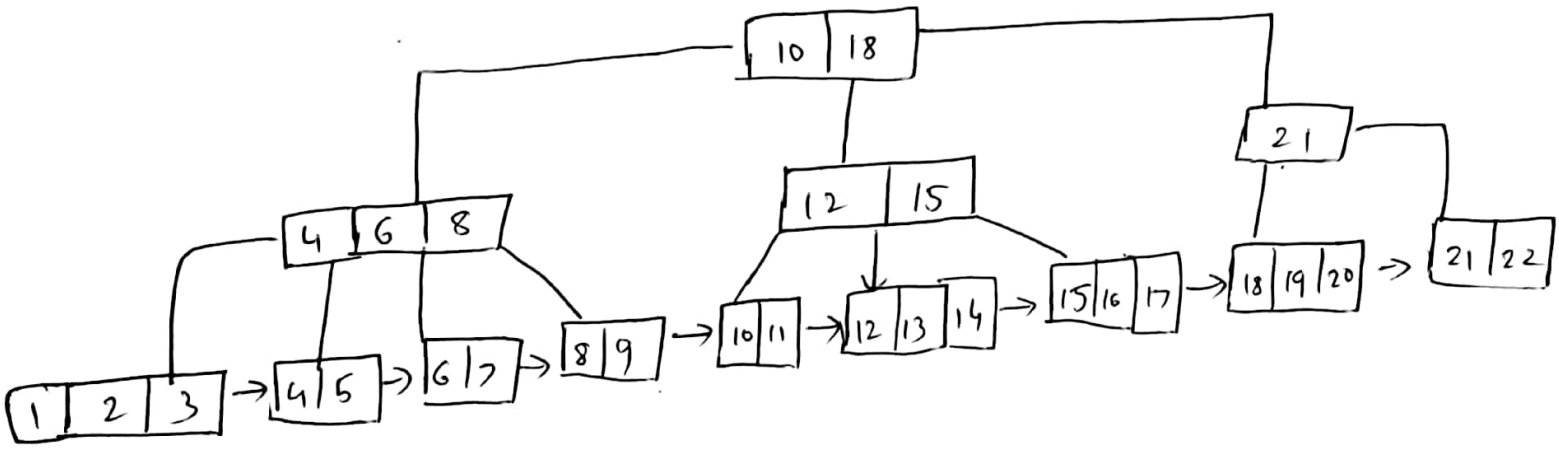
Ref. No. .....

Date .....

Q3



(5) → Split



Ref. No. ..... Date .....

Q4 a) Given: Size of One disk page = 1500 bytes

∴ Node capacity = $\frac{1500}{60}$ = 25

No of leaf nodes = ceil$\left(\frac{30000}{24}\right)$ = 1250

∴ Levels = 4

b) Nodes at each level are 1250, 50, 8, 1

c) Given: Key size = 10 bytes

∴ Node capacity, n = 60

No of leaf nodes = ceil $\left(\frac{30000}{59}\right)$ = 509

∴ Levels = 3

d) For 70% full page → 1050 bytes allowed

∴ n = 18 as 18 * 15 + 17 * 45 = 1035 < 1050

∴ No of leaf nodes = ceil $\left(\frac{30000}{17}\right)$ = 1765

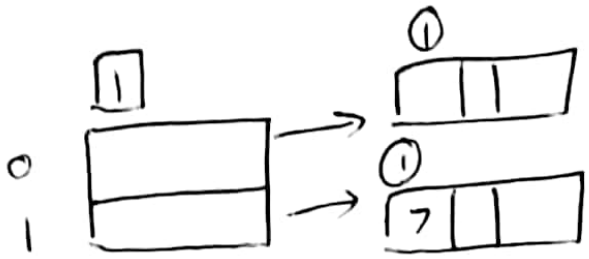
No of levels = 4

Ref. No. .....

Date .....

Q5

Insert 7



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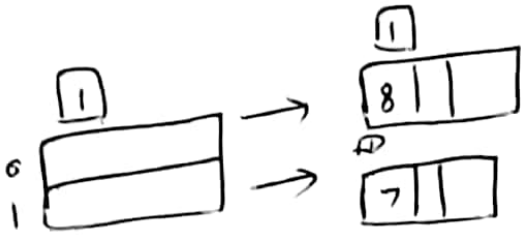

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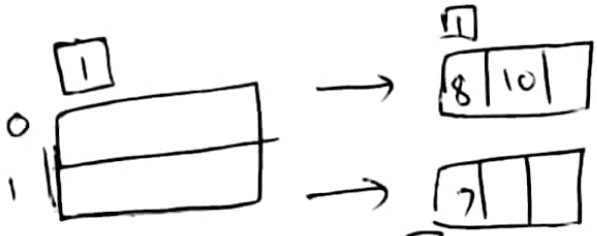

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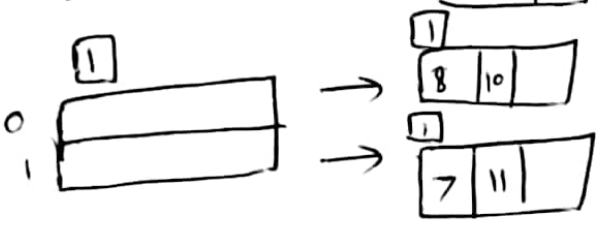

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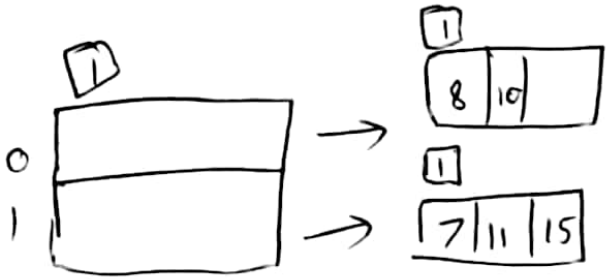
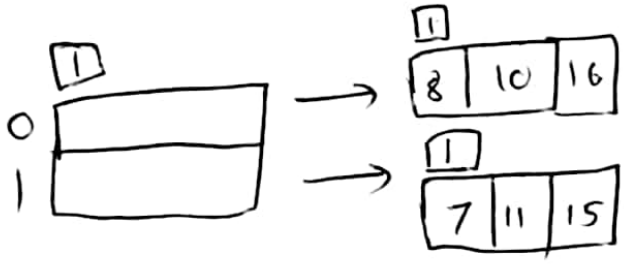
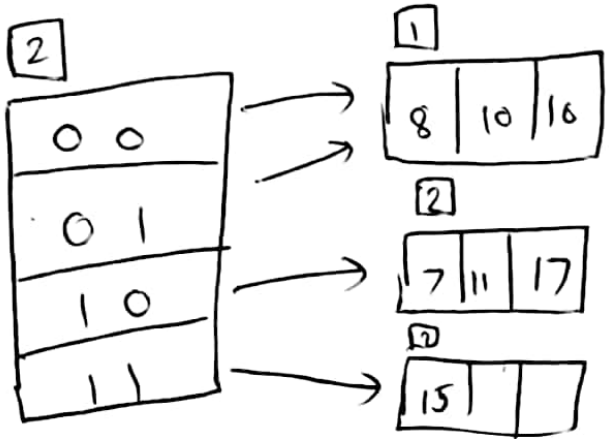


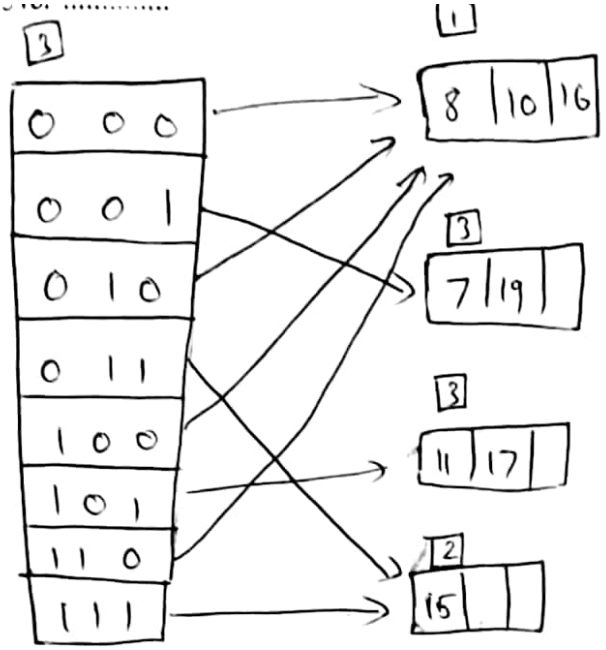
16



17



19



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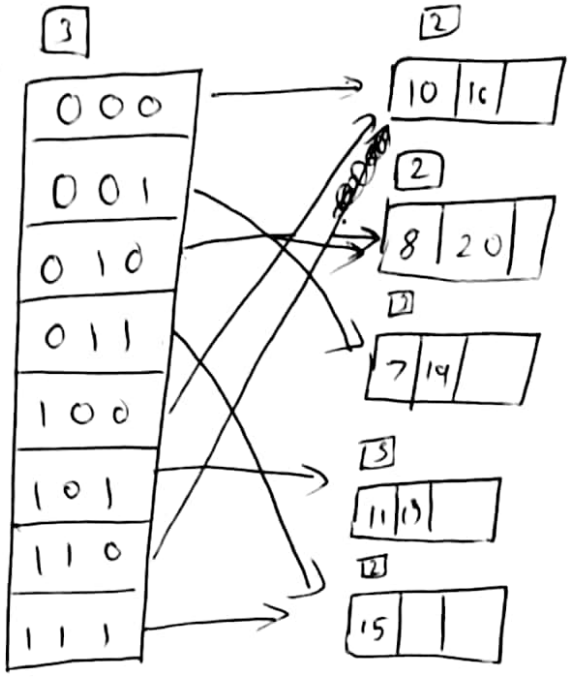

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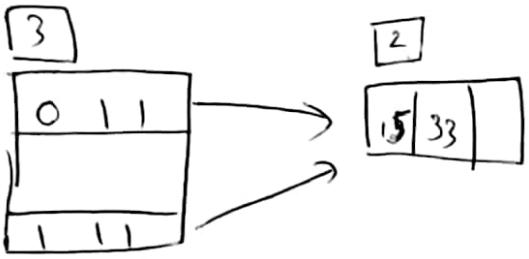
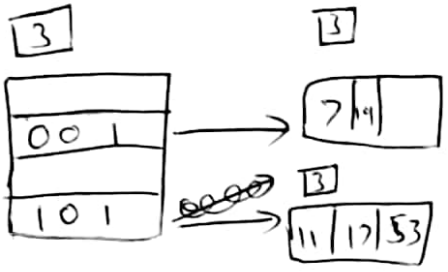


53.



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