

IT344 DBMS

Assignment No. : 01

Late Date for Submission: 29 September 2015

Total Marks: 5

NOTE: Write your answers on this word document and submit it in the appropriate submission folder. **Copying & late submission will result in ZERO marks.**

Question 1: A file has $r=20,000$ STUDENT records of fixed-length. Each record has the following fields:

NAME (30 bytes), SSN (9 bytes), ADDRESS (40 bytes), PHONE (9 bytes), BIRTHDATE (8 bytes), SEX (1 byte), MAJORDEPTCODE (4 bytes), MINORDEPTCODE (4 bytes), CLASSCODE (4 bytes, integer), and DEGREEPROGRAM (3 bytes). An additional byte is used as a deletion marker. Block size (512 bytes)

- a) Calculate the record size R in bytes. . **(0.75 Point)**

Answer : $R = (30 + 9 + 40 + 9 + 8 + 1 + 4 + 4 + 4 + 3) + 1 = 113$ bytes

- b) Calculate the blocking factor bfr and the number of file blocks b assuming an unspanned organization. . **(0.75 Point)**

Answer : $bfr = \text{floor}(B / R) = \text{floor}(512 / 113) = 4$ records per block

$b = \text{ceiling}(r / bfr) = \text{ceiling}(20000 / 4) = 5000$ blocks

- c) Calculate the average time it takes to find a record by doing a linear search on the file if the blocks are stored contiguously and double buffering is used **(1 Point)**

Answer : For linear search we search on average half the file blocks= $5000/2=2500$ blocks.

If the blocks are stored consecutively, and double buffering is used, the time to read

2500 consecutive blocks

$= s+rd+(2500*(B/btr))= 30+12.5+(2500*(512/409.6))$

$= 3167.5$ msec = 3.1675 sec

(a less accurate estimate is $= s+rd+(2500*bt)= 30+12.5+2500*1= 2542.5$ msec)

Question 2: Draw the B+tree (inserting) for the instructors, assume that the maximum entries in each node = 4 (Hint: split will be needed when the node reach 4 entities). **(2.5 marks)**

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| Srinivasan |
| Wu |
| Mozart |
| Einstein |
| El Said |
| Gold |
| Katz |
| Califieri |
| Singh |
| Crick |
| Brandt |
| Kim |

Answer:

