COMP 3311: Database Management Systems

Tutorial 6
Indexing

Exercise 1: Assume that a school keeps the following file with the records of its students:

Student(studentId: 4 bytes, name: 10 bytes, deptId: 4 bytes)

where deptId is the department id to which a student belongs. There exist 10,000 student records and 50 departments. A page is 128 bytes and a pointer is 4 bytes. The data file is sorted sequentially on studentId.

Record size:

$bf_{Student}$:

Pages needed:

a) Given the data file only, what is the cost of finding students in a particular department (e.g., CSE)?

b) How can we reduce the cost of this search?

c) Assume the main memory size is only one page. What is the cost to look up a particular student using this index?

Name: _____ Student#: _____ Date: _____

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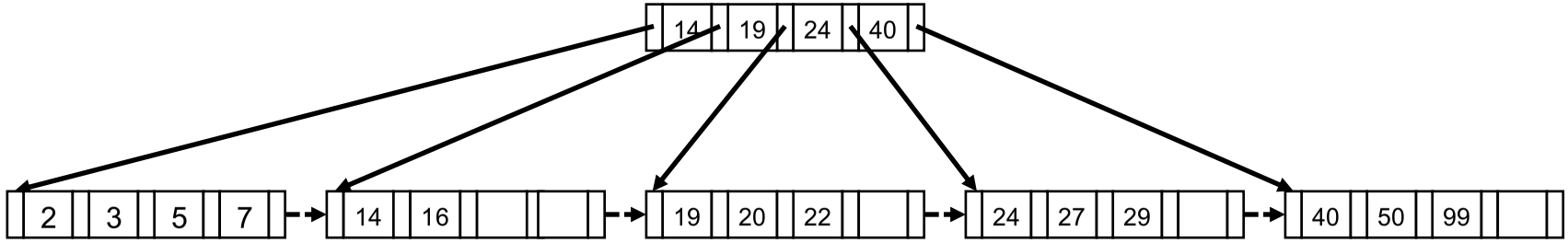
Exercise 2: For the B+-tree shown below, show the tree that would result after *successively* applying the following operations.

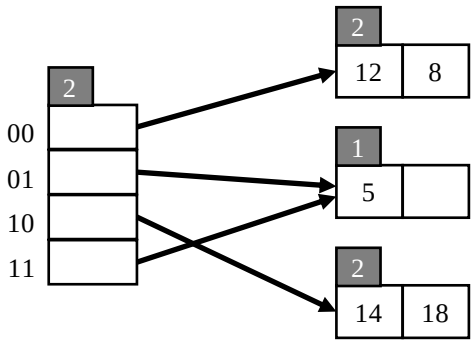
i. insert 8 ii. delete 2 iii.delete 3



You must upload this completed exercise sheet to Canvas by **11 p.m. today.**

Exercise 3: For the directory and buckets shown below, use extendable hashing and show what the directory and buckets would be after the following operations.

i. insert 22 (0001 0110) ii. insert 3 (0000 0011) iii. insert 9 (0000 1001) iv. delete 18



Hash values

8	(0000 1000)
5	(0000 0101)
12	(0000 1100)
14	(0000 1110)
18	(0001 0010)

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