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; 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 page I/O 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 page I/O cost to look up a particular student using this index?

Do not upload this exercise sheet to Canvas.

Name: _____ Student#: _____ Date: _____

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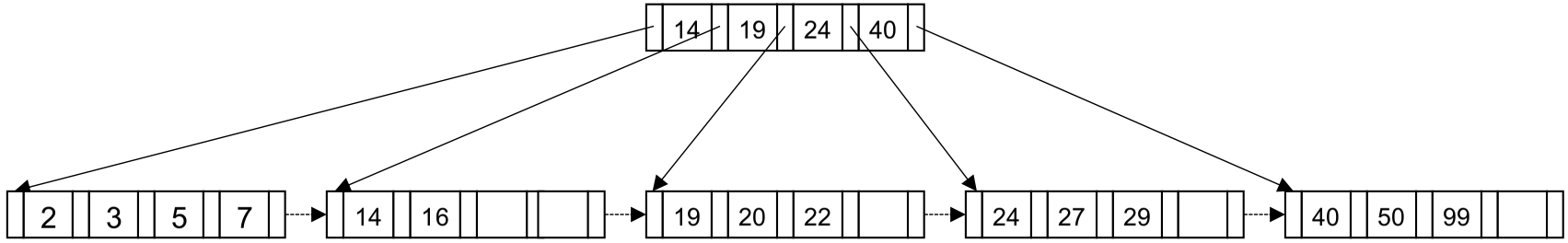
Exercise 2: For the B+-tree shown below, show the tree that would result after *successively* applying the following operations in order.

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



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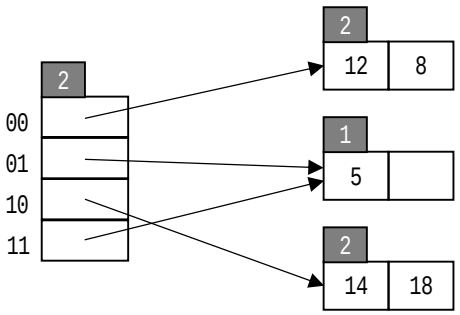
Exercise 3: For the directory and pages shown below, use extendable hashing and show what the directory and pages would be after the following operations.

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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