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Data Bases II, Spring 2017
Practice Assignment 1

Part One: Practical Problems

Exercise 1-1

For the given dummy relation below, called "Fiction_Character", do each of the following:

a) Page the relation appropriately assuming a page can hold two records, or four key-pointer pairs
b) Construct primary, secondary, dense, sparse, and multi-level indices; briefly explain what data columns can be chosen for each type of index
c) In case of a dense primary index is constructed, show the steps of:
   i. Inserting a tuple given as follows,:

Minnie	Mouse	123 Fantasy Way	Anaheim	72

   ii. Deleting record number 3
   iii. Updating Tweety's age to be 29

Char_ID	First Name	Last Name	Address	City	Age
1	Mickey	Mouse	123 Fantasy Way	Anaheim	73
2	Bat	Man	321 Cavern Ave	Gotham	54
3	Wonder	Woman	987 Truth Way	Paradise	39
4	Donald	Duck	555 Quack Street	Mallard	65
5	Bugs	Bunny	567 Carrot Street	Rascal	58
6	Wiley	Coyote	999 Acme Way	Canyon	61
7	Cat	Woman	234 Purrfect Street	Hairball	32
8	Tweety	Bird	543	Itotltaw	28

-Figure 1.1: Fiction_Character Relation-

Exercise 1-2

Assume that a page can hold up to two rows. If we have a Table D with 16 rows with the following keys:

D = {50, 80,100, 100, 100, 150, 150, 200, 200, 300, 410, 410, 410, 420, 430,450}

Build a 3-level index on D – one of which must be dense. Clearly explain how you handle duplicates.

Part Two: Theoretical Questions

Exercise 1-3 True or False

a) When a sparse index is used, each record must have an entry in the index.

b) Secondary indices are always dense.

c) Considering 2 levels of indices, any of them can be either sparse or dense.

d) You can only use a sparse index if the data file is sorted by the search key, while a dense index can be used for any search key.

e) In multilevel indexes, a primary index created for its first level is classified as the first level of multilevel index.

f) A type of index which is based on any candidate key or a non-key field which may have duplicate values is classified as a primary index.

Part Three: Text Book Questions

Exercise 1-4

Suppose blocks hold either three records, or ten key-pointer pairs. As a function of n "the number of records", how many blocks do we need to hold a data file and:

a) A dense index

b) A sparse index

Exercise 1-5

Repeat the exercise above if we use as many levels of index as is appropriate, until the final level of index has only one block.