DBS: Database Systems Carsten Schürmann Date: October 5, 2009

Assignment 4

Due: see course homepage

1. (9 pts) Construct a B+-tree for the following set of key values:

(11, 13, 15, 17, 20, 23, 26, 30, 34)

Assume that the tree is initially empty and values are added in ascending order. Construct B+-trees for the cases where the number of pointers that will fit in one node is as follows:

- (a) Four
- (b) Six
- (c) Eight
- 2. (9 pts) For each B+-tree of the previous exercise, show the form of the tree after the following series of operations:

Insert 9, Insert 10, Delete 26, Delete 23

3. (6 pts) Suppose that we are using dynamic (extendable) hashing on a file that contains records with the following search-key values:

Show the dynamic hash structure for this file if the hash function is $h(x) = x \mod 8$ and buckets can hold three records.

4. (6 pts) Show how the dynamic hash structure of the previous exercise changes as a result of the following series of operations:

Delete 13, Delete 21, Insert 3, Insert 19