COMP 5120/6120 Database Systems I

Fall 2017
Homework #4
Due: 12/5/2017 11:50 pm

1. Suppose that a page can contain at most four data values and that all data values are integers. Using only B+ trees of order 2, give examples of each of the following:

    a. A B+ tree whose height changes from 2 to 3 when the value 25 is inserted. Show your structure before and after the insertion.

    b. A B+ tree in which the deletion of the value 30 leads to a redistribution. Show your structure before and after the deletion.

    c. A B+ tree in which the deletion of the value 35 causes a merging of two nodes but without altering the height of the tree.

2. Answer the following questions about Linear Hashing:

    a. How does Linear Hashing provide an average-case search cost of only slightly more than one disk I/O, given that overflow buckets are part of its data structure?

    b. Does Linear Hashing guarantee at most one disk access to retrieve a record with a given key value?