CS186 Discussion Section Week 4
Hash Based Indexing and Relational Algebra
Fall 2013

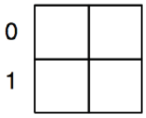
Hash Indexing

1. When would we use a tree over a hash index and vice versa?

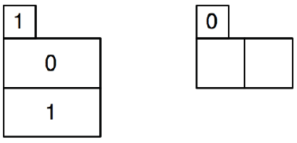
2. What is the difference between static, extendible and linear hashing?

3. Consider the following sequence of insertion in a hash index. All pages hold 2 data entries. Draw the structure for the different types of hashing.
   Sequence of H(key): 5(00101), 11(01011), 2(00010), 17(10001), 8(01000), 13(01101), 3(00011)

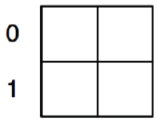
   Static hashing: We have 2 buckets

   Extendible Hashing: We start with 2 directory slots and 1 data bucket. Draw pointer lines and find the global and local depth of each bucket.

   Linear Hashing: We start with 2 buckets. A split is triggered by the creation of an overflow page.

Relational Algebra

Consider the schema:

Suppliers(sid:integer, sname:string, address:string)
Parts(pid:integer, pname:string, color:string)
Catalog(sid:integer, pid:integer, cost:real)

Write relational algebra expressions for the following queries:

1. Find the SIDs of all suppliers who supply either a red or a green part.

2. Find the SIDs of all suppliers who supply both a red part and a green part.

3. Find the SIDs of all suppliers who supply either a red part or are located at “123 University”.

4. Find the PIDs of all parts that are supplied by two or more suppliers.

5. Find the names of all suppliers who do not supply any parts.