CS 245: Database System Principles

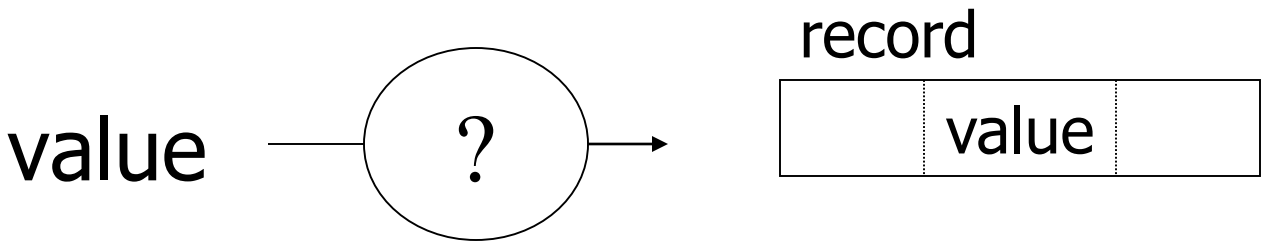
Notes 5: Index in SQL

Peter Bailis

Modifications from CZ

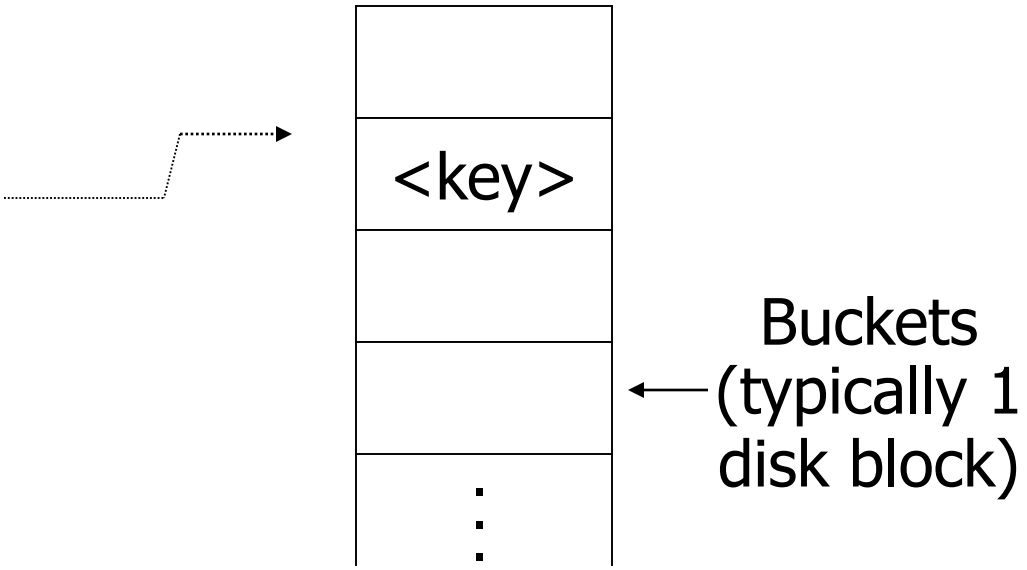
Chapter 4

Indexing



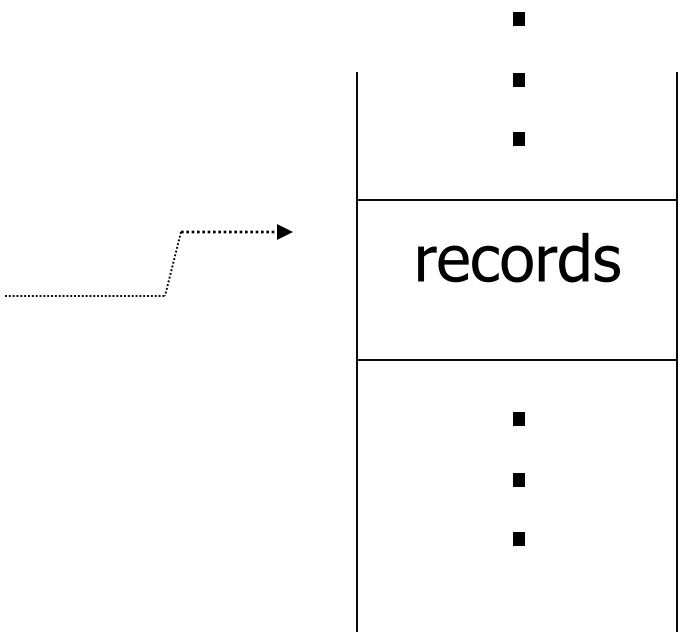
Hashing

key $\rightarrow$ h(key)



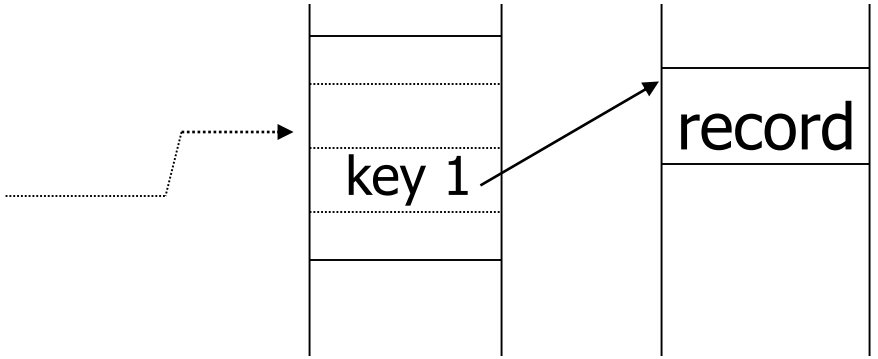
Two alternatives

(1) key $\rightarrow$ h(key)



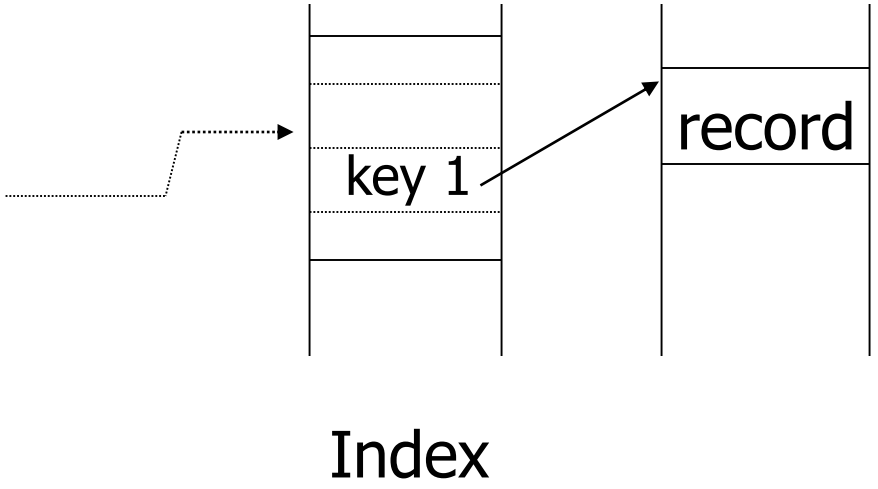
Two alternatives

(2) key $\rightarrow$ h(key)



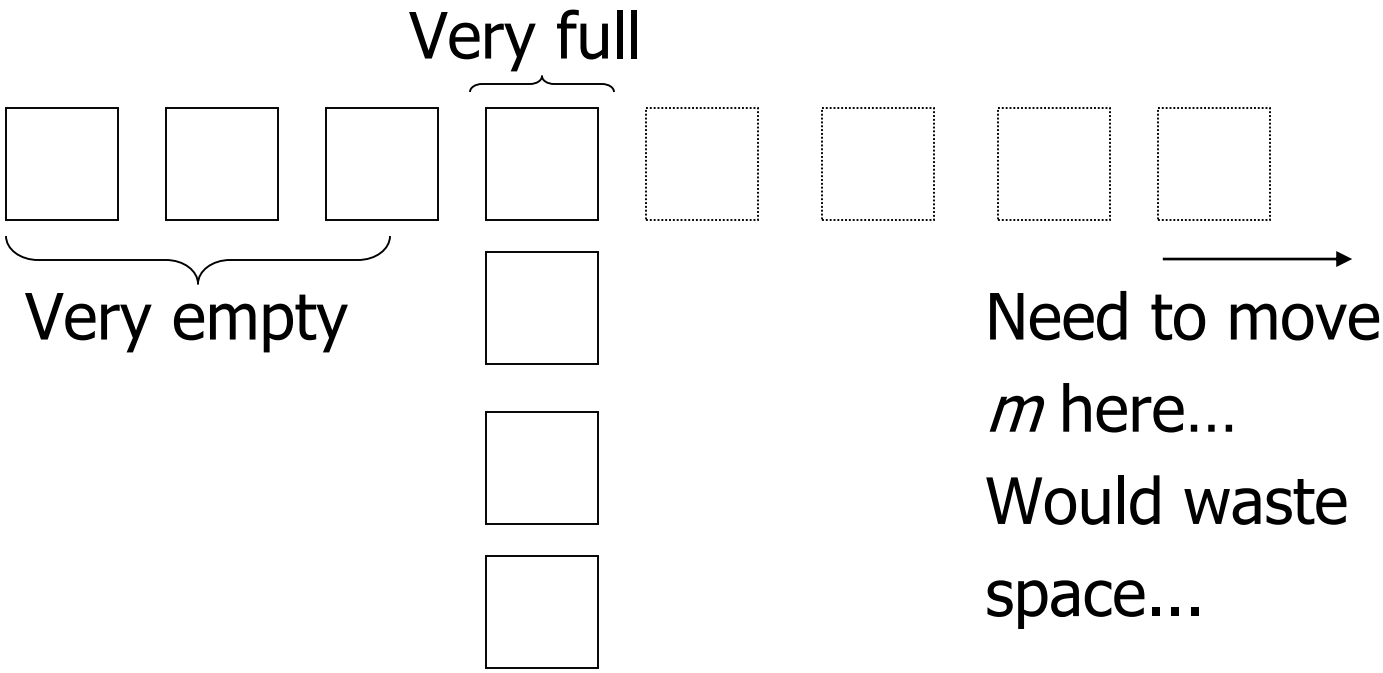
Two alternatives

(2) key $\rightarrow$ h(key)



- Alt (2) for "secondary" search key

Example: BAD CASE



Next:

- Index definition in SQL
- Multiple key access

Indexing with Hashing

- Hashing good for probes given key

  e.g., SELECT …
  FROM R
  WHERE R.A = 5

Indexing with B Trees

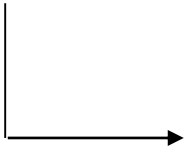
- INDEXING (w/ B Trees) good for

  Range Searches:

  e.g., SELECT
  FROM R
  WHERE R.A > 5

Index definition in SQL

- Create index name on rel (attr)
- Create unique index name on rel (attr)



defines candidate key

- Drop INDEX name

Note CANNOT SPECIFY TYPE OF INDEX

(e.g. B-tree, Hashing, …)

OR PARAMETERS

(e.g. Load Factor, Size of Hash,...)

... at least in SQL...

Depending on Database implementation.

Note ATTRIBUTE LIST $\Rightarrow$ MULTIKEY INDEX

(next)

e.g., CREATE INDEX foo ON R(A,B,C)

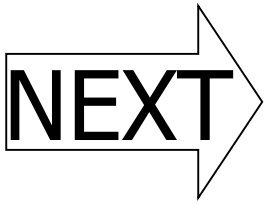
Summary

- Indexing
  - with Hashing
  - with B Tree

- Index Definition in SQL
-

The BIG picture….

- Chapters 13 & 14 [14]: Access Mechanisms
  - Indexes
  - B trees
  - Hashing
  - Multi key



Books:
A First Course in Database Systems, Chapter 1- Chapter 12
Database System Implementation, Chapter 13- Chapter 23

Reading Books

- Skim the following sections:
  - Sections 14.3.6, 14.3.7, 14.3.8
    [Second Ed: 14.6.6, 14.6.7, 14.6.8]
  - Sections 14.4.2, 14.4.3, 14.4.4
    [Second Ed: 14.7.2, 14.7.3, 14.7.4]
- Read the rest

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