ECS 165B: Database System Implementation
Lecture 5

UC Davis

April 7, 2010

Acknowledgements: portions based on slides by Raghu Ramakrishnan and Johannes Gehrke.

Class Agenda

- Last time:
  - Project-related logistics: subversion, code submission
  - Finish indexing review; tree-structured indices in depth

- Today:
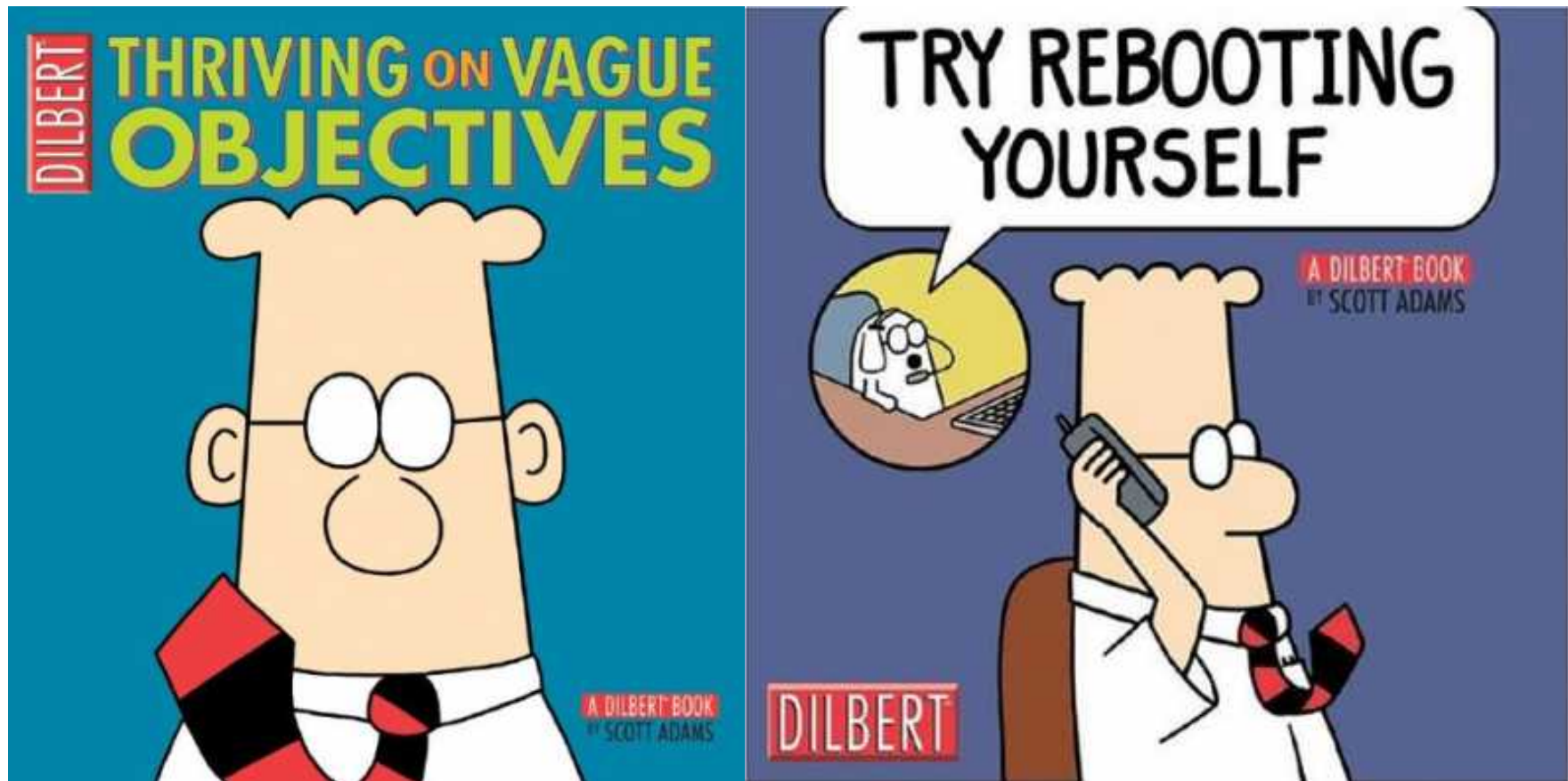 - Record Manager cookbook session

Announcements

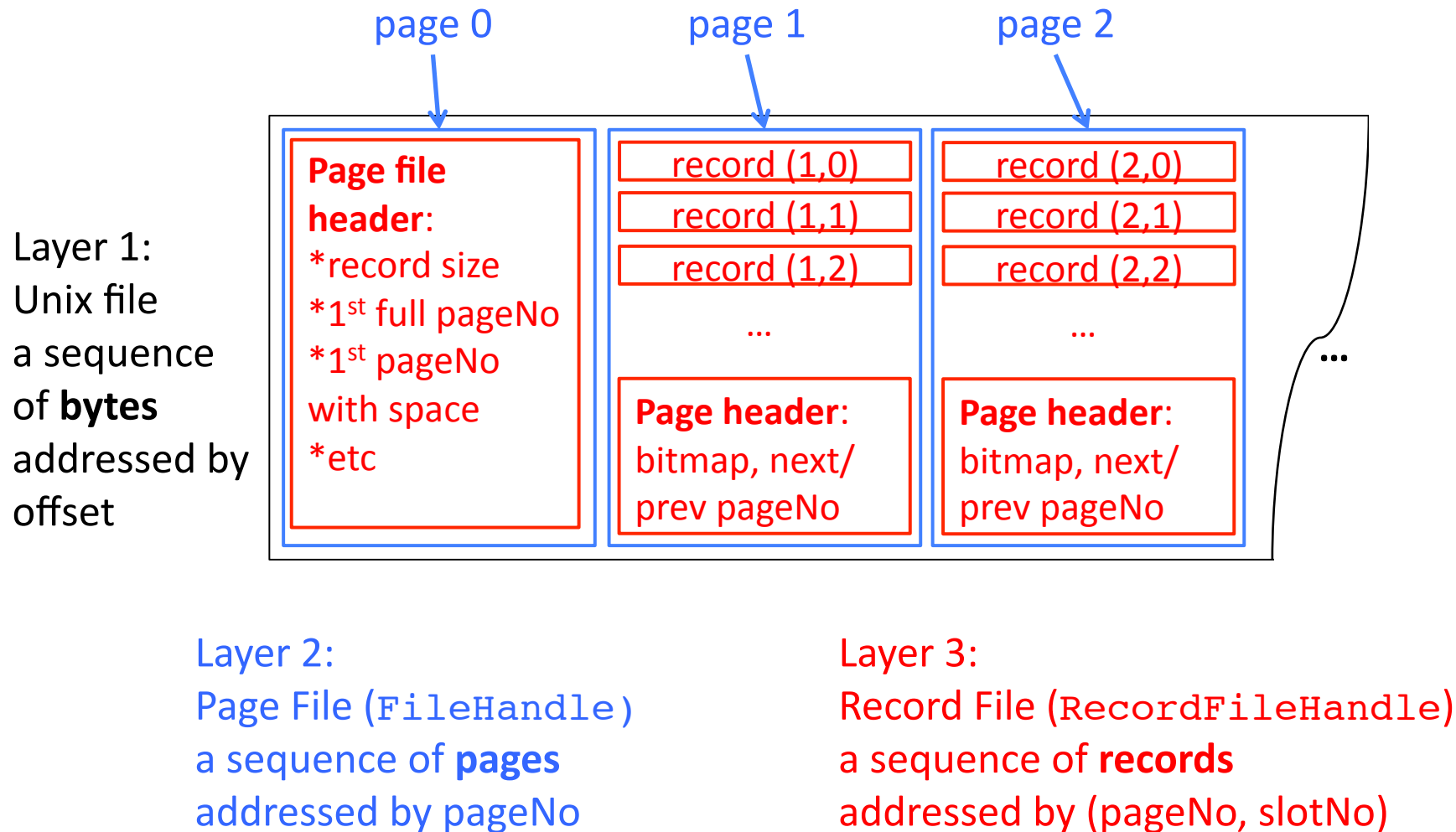Repositories online, team assignments straightened out

Texbook now on reserve in Shields (2 copies, 1-day checkout)

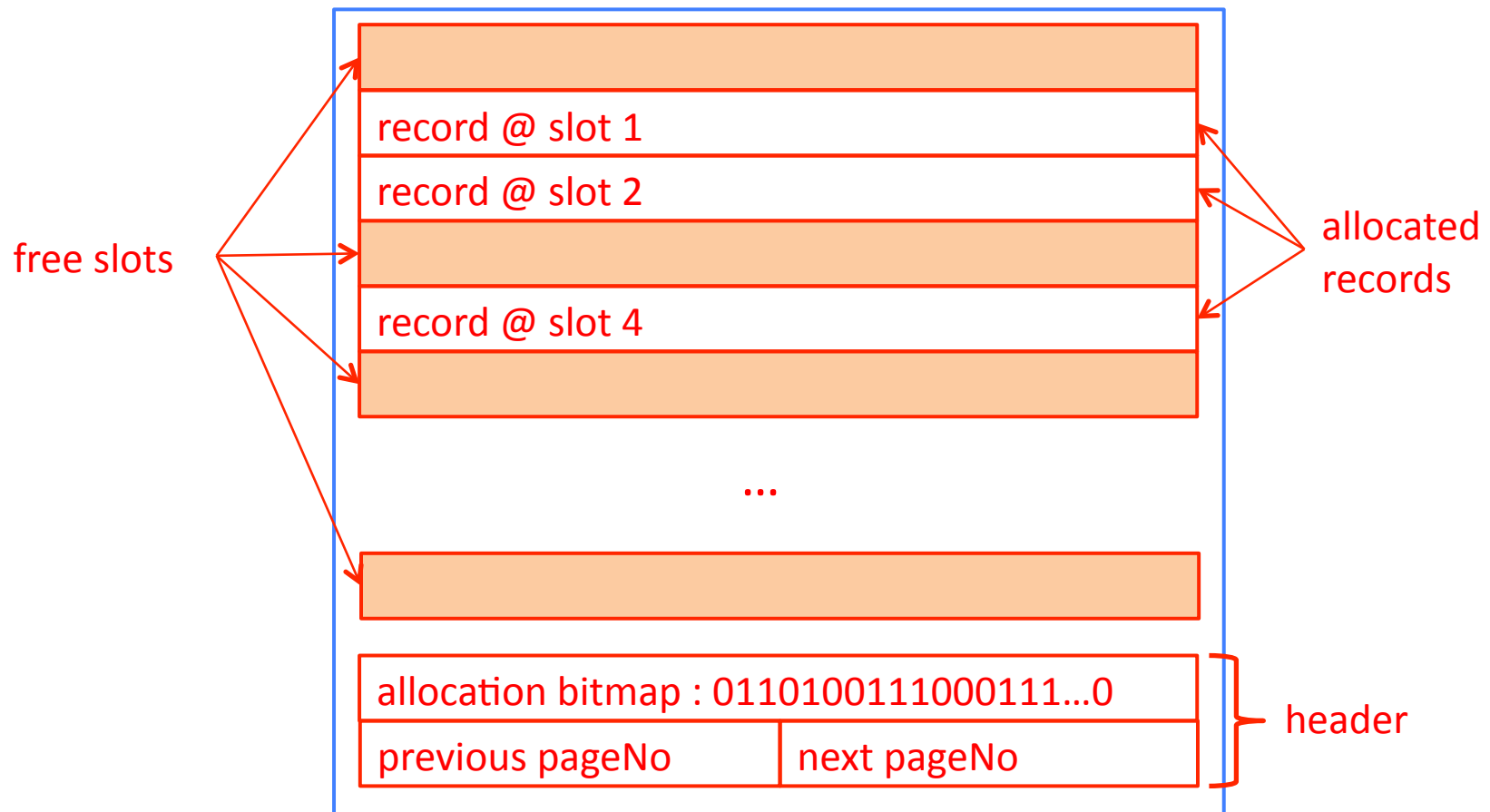First discussion section Friday @11am

Scott Adams on DavisDB Pt 1?

Suggested Record File Architecture

page 0   page 1   page 2

Layer 1:
Unix file
a sequence
of **bytes**
addressed by
offset

Page file header:
*record size
*1st full pageNo
*1st pageNo with space
*etc

record (1,0)
record (1,1)
record (1,2)
...

Page header:
bitmap, next/ prev pageNo

record (2,0)
record (2,1)
record (2,2)
...

Page header:
bitmap, next/ prev pageNo

...

Layer 2:
Page File (`FileHandle`)
a sequence of **pages**
addressed by pageNo

Layer 3:
Record File (`RecordFileHandle`)
a sequence of **records**
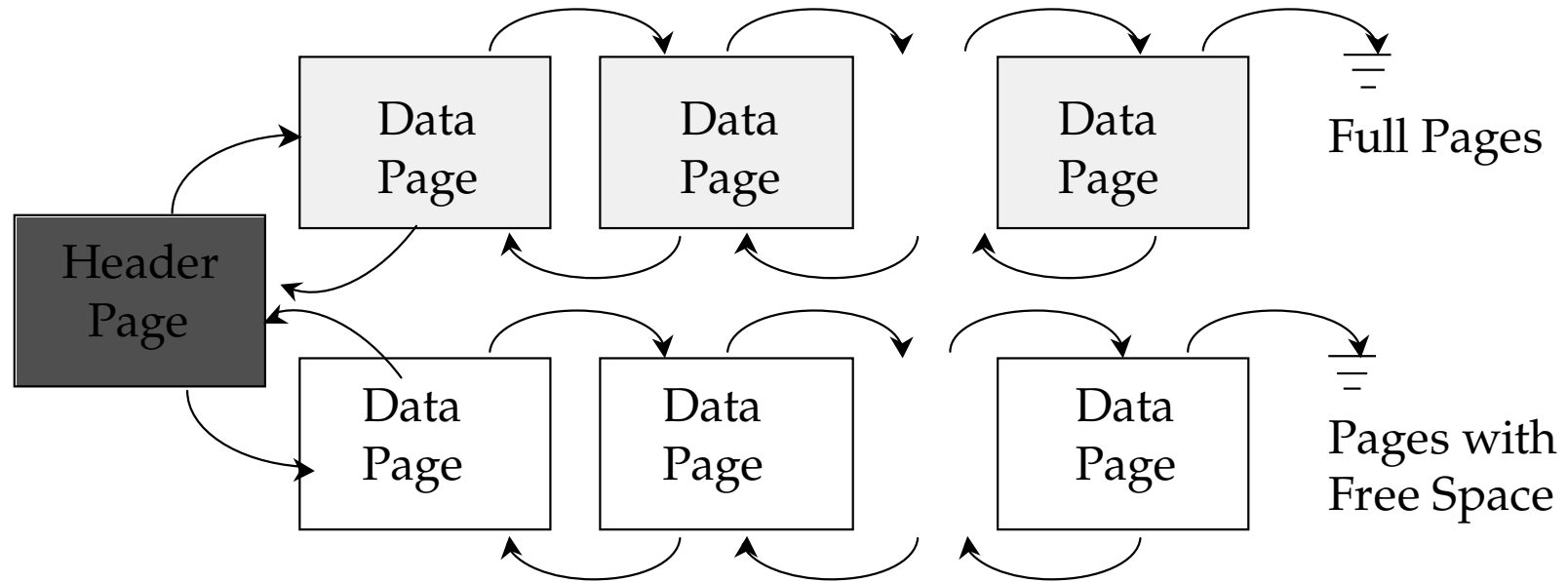addressed by (pageNo, slotNo)

Suggested Record File Header Page Format

record size
pageNo of first page with free space
pageNo of first page with no free space
… whatever else you want to record …

Suggested Data Page Format (cf. Lecture 2)

free slots

record @ slot 1
record @ slot 2

record @ slot 4

allocated records

...

allocation bitmap : 0110100111000111...0

previous pageNo | next pageNo

header

Suggested Scheme for Tracking Free Space in a Record File (cf. Lecture 2)

- Each data page contains two "pointers" (*pageNo's*) in addition to bitmap and record contents

- Header page has "pointers" to first page in each list

OK, Let's Try Writing Some Code!