Database Management Systems

- Physical Layer

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Physical Layer

- The way data is stored (physical layer) is different than the way data is shown to the user (schema)
  - Why?

Physical Layer

- What kind of information is stored in a database system?
  - Should all of this data be stored in the same way?
  - What should the criteria for data storage be?

Records

- To understand how data is stored, we must understand the structure of that data
  - What affects the size of a record?
  - Are all records in the same table going to be the same size?
    - How does this affect how a record is stored?

Operations

- What kinds of operations will be performed on these files?
  - How does that affect the way the data is stored?

Heap Files

- Simplest format
  - Unordered records
- How to insert?
  - Efficiency?
- How to search?
  - Efficiency?
- How to modify/delete?
  - Efficiency?

Heap Files

- Is it faster to manipulate data on disk or in memory?
  - How can we accommodate this?

Heap Pages

- Contains:
  - Header
  - Tuples
- Heap Pages are typically constant in size
  - Manages addition/deletion of tuples
- How does this affect the design of our records?

HW1 Overview

- Tuples
- Catalog
- Heap Files/Pages

Exercise

- Design your Tuple class
  - What information does it need to do its job?
  - What behaviors will it have?

Exercise

- Given a heap page of size m and a record of size n, determine how many records can fit on the page.
Hint: don't forget the header!

Exercise

Develop pseudocode for adding a record to a heap file. The input should be a tuple.