

Carnegie Mellon Univ.
Dept. of Computer Science
15-415/615 - DB Applications

C. Faloutsos – A. Pavlo
Midterm Review

Administrivia – Midterm

- **Who:** You
- **What:** Midterm Exam
- **When:** Wed Oct 19th 3:00pm - 4:20pm
- **Where:** DH A302
- **Why:** The last presidential debate is that night so you can relax after the exam.

Administrivia – Midterm

- **What to bring:**
 - CMU ID
 - Calculator
 - One page of notes (double-sided)
- **What not to bring:**
 - Live animals

Administrivia – Midterm

- Covers up to *External Sorting* (inclusive).
 - Closed book, one sheet of notes (double-sided)
 - Please email Christos + Andy if you need special accommodations.
- <http://cmudb.io/fl6-midterm>

Extended Office Hours

- **Christos:**
 - Tuesday Oct 18th @ 1:00pm-3:00pm
- **Andy:**
 - ~~Monday Oct 17th @ 10:30am-11:30am~~
 - ~~Monday Oct 17th @ 1:00pm-2:00pm~~

Entity Relationships

- Cardinalities
- Total vs. Partial Participation
- Strong vs. Weak Entity Set
- Primary Key vs. Partial Key

Relational Model

- Integrity Constraints
- Relation Algebra
- Relational Calculus
 - Primitive Operators
 - Derived Operators

SQL

- Basic operations:
 - SELECT / INSERT / UPDATE / DELETE
 - WHERE predicates
 - Output control
- More complex operations:
 - Joins
 - Aggregates
 - Common Table Expressions

Storage

- Buffer Management Policies
 - LRU / MRU / CLOCK
- On-Disk File Organization
 - Heaps
 - Linked Lists
- Understand high-level trade-offs of different approaches.

Indexes

- B-Tree vs. B+Tree
- Basic Operations:
 - Insertions / Deletions
 - Splits / Merges

Hashing

- Extendible Hashing
 - Global Depth vs. Local Depth
 - Overflow Chains
- Linear Hashing
 - Insertion / Splitting
 - Overflow Chains
- Comparison with B+Trees

Sorting

- Two-way External Merge Sort
- General External Merge Sort
- Cost to sort different data sets with different number of buffers.