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

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Midterm Review
Administrivia – Midterm

• **Who:** You

• **What:** Midterm Exam

• **When:** Wed Oct 21\(^{st}\) 3:00pm - 4:20pm

• **Where:** DH A302

• **Why:** You were recruited to work on Hillary Clinton’s presidential campaign as a data scientist.
Administrivia – Final Exam

- **What to bring:**
  - CMU ID
  - Calculator
  - One page of notes (double-sided)

- **What not to bring:**
  - Live animals
Extended Office Hours

• **Christos:**
  – Tuesday Oct 20\(^{th}\) @ 11:00am-12:00pm
  – Tuesday Oct 20\(^{th}\) @ 12:00pm-1:00pm

• **Andy:**
  – Monday Oct 19\(^{th}\) @ 9:00am-10:00am
  – Monday Oct 19\(^{th}\) @ 12:00pm-1:00pm
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
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
• Understand high-level trade-offs of different approaches.
Indexes

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

- Extendible Hashing
- Linear Hashing
Sorting

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