Midterm Review

CPS 116
Introduction to Database Systems

Announcements (Tue. Oct. 4)
- Homework #1 graded
- Homework #2 due today
  - Sample solution available tomorrow (Wed.)
- Midterm exam in class Thursday
  - Open book, open notes
  - Additional copies of sample midterm + solution (from 2009) available today
- Project milestone #1 due next Thursday
  - See course website for description handout

Topics covered so far
- Relational model + declarative query language
- Physical data independence
- Relational algebra: \( \sigma, \pi, \rho, \mu, \sigma_{M}, \mu_{M}, \rho_{M}, \sigma_{M} \cap, \sigma_{M} \cup \)
- Monotonicity
- Entity-relationship design
- Multiplicity, weak entity sets, ISA relationships
- Design theory (FD’s \( \rightarrow \), MVD’s \( \leftrightarrow \), BCNF, 4NF)
- Help eliminate redundancy
  - “Key, the whole key, nothing but the key”
  - Attribute closure, chase
- SQL
  - NULL and three-value logic \( \rightarrow \) nifty feature, big mess
  - Bag versus set semantics
  - SFW (or SPJ) queries, subqueries, grouping and aggregation
  - Modifications
  - Constraints \( \rightarrow \) the more you know the better you can do
  - Recursion: fixed-point iteration; stratified recursion
- OLTP vs. OLAP