Practice Problems
and Wrap Up

Introduction to Databases
CompSci 316 Spring 2017
Announcements (Wed., Apr. 26)

• **Project code** due tonight: Wednesday, April 26, 11:59 pm
  - See all announcements about project report and demo on piazza
  - Please do a final coordination as a group

• **Final Exam**
  - May 2 (next Tuesday), 2-5 pm, in class
  - Everything covered in the class (up to last lecture) is included
  - If you need special accommodation, please email me
  - Open book, open notes
    - any written material is allowed
    - no electronic gadget (phone, laptop, calculator) is allowed

• **Practice final exam uploaded**
  - under sakai -> resources -> practiceproblems
  - prepare and try it first in 3 hours before seeing solutions!

• **Tomorrow’s demonstrations**
  - Please plan for strict 15-16 mins of demonstration
  - leave 3-4 mins for questions
Today

• 10 Practice problems and wrap up
• A few mins for you to try each problem before we discuss solutions
• Disclaimer: Numerous other possibility – this is not a representative of what may or may not appear
• 10 mins break for filling out course evaluations after 5 problems
• If we have time, we can review any topic you want
Practice Problems are on Sakai

- Resources -> PracticeProblems -> Lecture27Probs
What did we learn in this class?

- Relational Model, Query Languages, and Database Design
  - SQL
  - RA
  - E/R diagram
  - Normalization
- DBMS Internals
  - Storage
  - Indexing
  - Query Evaluation
  - External sort
  - Join Algorithms
  - Query Optimization
- Transactions
  - Basic concepts
  - Concurrency control
  - Recovery
- XML
  - DTD and XML schema
  - XPath and XQuery
  - Relational Mapping
- Selected other topics
  - Parallel DBMS
  - Map Reduce
  - Data Mining
  - Data Warehousing
  - Distributed DBMS
  - NOSQL and Column Store
Many other research areas : 1/2

• Data analytics, interactive exploration, visualization
• Big data systems (Spark, Map Reduce, …)
• Approximate Query processing
• Storage and new hardware (GPU, FPGA, memory..)
• Social networks
• Data streams
• Incremental View Maintenance
• Tree and Graph Databases
• Data integration
• Data cleaning
Many other research areas: 2/2

- Query optimization
- NOSQL and NewSQL
- User preferences
- Machine learning in databases
- Spatial and temporal data
- Data privacy and security
- Crowd sourcing
- Data provenance
- Inconsistent and incomplete databases
- Database theory (logic, algorithms, complexity)
- ….
More resources

• Check out top database conferences (huge participation from industry and academia)
  • SIGMOD and PODS  http://sigmod2017.org
  • VLDB http://www.vldb.org/2017
  • ICDE http://icde2017.sdsc.edu
  • ICDT http://edbticdt2017.unive.it (PODS and ICDT are db theory conferences)

• Advanced (graduate) database courses at Duke CS

• Duke CS database group: https://sites.duke.edu/duke_dbgroup/

• Always happy to talk if you are interested in database related research!
• Please fill out course evaluations!

• Good luck with all your exams!

• and Thank You!