15-721
DB Sys. Design & Implementation

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What we learn
• Seminal work that shaped the DB World
• How to design and implement a DBMS
• How to understand a commercial DBMS
• Secrets about real systems:
  – algorithms,
  – mechanisms,
  – policies to manage data
• Open research problems you can work on

Course Times/Days/People
• Tu-Thu 3-4:20, WeH 4615A
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Course Prerequisites
• 1 DB undergrad course *OR* spend 2x time studying background information:
  – Relational model + basic operations (e.g., select, join)
  – B-trees, indexing primitives
  – Physical/logical database design
  – I.e., first few chapters from Ramakrishnan’s or Korth’s textbooks
  • and/or check foils of 15-415 at
    www.cs.cmu.edu/~christos/courses/dbms.F02/SLIDES/all-foils.html
• Fluent in C/C++
• Required text is in “Red Book” (most papers are online)

Grading
50% Project
1-3 person, self-policed teams
20% Midterm
20% Comprehensive Final Exam
10% Homeworks

Suggested project list: next lecture

Roadmap
• First two lectures: System R
• Readings:
  – Intro from “The Roots” chapter in red book
  – Codd’s paper
  – 2 System R papers
Topics overview

[we’ll follow text closely]
1) Roots: System R and Ingres
2) Implementation: buffering, indexing, q-opt
3) Transactions: locking, recovery
4) Distributed DBMSs
5) Parallel DBMSs: Gamma, Alphasort
6) OOFOR DBMS
7) Data Analysis - data mining
8) Benchmarks
9) Vision statements
   extras (streams/sensors, graphs, multimedia, web, fractals)