CS 143: Data Management Systems

Time and Place

- **Hours:** Monday and Wednesday, 10:00AM-11:50AM
- **Location:** Online https://ucla.zoom.us/j/96835293526

Instructor

- **Name:** Junghoo "John" Cho
- **Email:** cho@cs.ucla.edu
- **Office:** Boelter Hall 3531H
- **Office hour:** Wed 2-3PM
    - You can attend either in person in Boelter Hall or via zoom

Learning Goal

The main goal of this course is to teach students how to store, manage, and access large-scale data using data management systems. Among many existing systems, our primary focus will be on relational database management systems (RDBMS) and structured query language (SQL), but we will review a few non-relational data management systems as well.

The topics that will be covered in the class include:

- Relational model
- Relational algebra
- SQL
- Entity-relationship model
- Relational design theory
- Key data structure and algorithms for DBMS
- Query execution
- Transactions
- NoSQL Database
- Non-relational data processing

Learning Objectives

By the end of the quarter, students are expected to:

- Have a clear understanding of data models, in particular relational model
- Have a mastery of relational query languages, including relational algebra and SQL
- Be able to create good table designs for RDBMS
- Have a clear understanding of the role of indexes in DBMS and its related data structures, such as B+Tree
- Have a basic understanding of key algorithms for query processing, such as join algorithms
- Have an understanding of issues related to concurrency and the ACID guarantee
- Be able to use DBMS's, such as MySQL, for real-world data analysis and application development
- Have experience with and a basic understanding of non-relational data management systems

Text Book

One textbook is required for the course:

- Database System Concepts Abraham Silberschatz, Henry F. Korth, and S. Sudarshan McGraw-Hill Science/Engineering/Math

Quiz

We will have two in-person quizzes:

- **First:** 5th-week Saturday 10-11:59 AM
- **Second:** 10th-week Saturday 10-11:59 AM

Alternate Quiz

Contact the class staff if you are unable to be physically present during our designated hours.

Grading

The final grade will be assigned based on the following criteria:

- Homework: 10%
- Project: 40%
- Quiz: 50%

All assignments should be submitted via Gradescope

Online discussion group

All students must join and utilize CS143 discussion group at Campuswire by registering at https://campuswire.com/p/G17AAD1D2/. This online discussion group will be the primary channel for students to ask course and project related questions and for others, including the TA, to answer them. Note that some of your questions may have already been discussed and answered by others, so please search the board first before asking a question. When you join the discussion group, you may choose to receive email notifications for new messages or just to read them on the board. *You are responsible for all your posts to Piazza.* Thus, please do NOT post any content that might be considered as a violation of honor codes, such as your solution to a homework. If you have any doubt or concern, please **ASK** the TA/lecturer before posting it.

Academic Integrity

At http://www.deanofstudents.ucla.edu/Academic-Integrity, the Office of the Dean of Students presents University policy on academic integrity, with special attention to cheating, plagiarism, and student discipline. The policy summaries don't specifically address programming assignments in detail, so we state our policy here.

Each of you is expected to **submit your own original work.** On many occasions it may be useful and have an educational value to ask others (the instructor, the TA, or other students) for hints or help, or to talk generally about your strategies. Such activity is both acceptable and encouraged, but **you must indicate any assistance (human or otherwise) that you received.** Any assistance received that is not given proper citation will be considered plagiarism. In addition, to avoid unintended sharing and copying

of your work, **publishing your work on a public repository, such as public github, is strictly prohibited.**

You must abide by this policy in addition to the policies expressed in the UCLA Student Conduct Code. If a violation of the policies is suspected, in accordance with University procedures, we will have to submit the case to the Dean. A typical penalty for a first plagiarism offense is suspension for one or more quarters. A second offense usually results in dismissal from the University of California.