CS 121: Relational Databases   Winter 2026
Course Syllabus

Information At-A-Glance

Instructor	
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Office:	ANB 122
Office Hours:	By private meeting

| Course Website |
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| https://relationaldatabase.systems |
| Visit early. Visit often. |

Lecture
ANB 105
MWF 10:00 − 10:55 PM

Course Overview

Prerequisites: CS 24, CS 38

This course explores the theory, algorithms, and approaches behind modern relational database systems. Topics include the relational data model, relational algebra, SQL, file storage formats, query planning and optimization, query evaluation, and indexes. Assignments consist of a series of programming projects extending a working relational database, giving hands-on experience with the topics covered in class.

Assessments
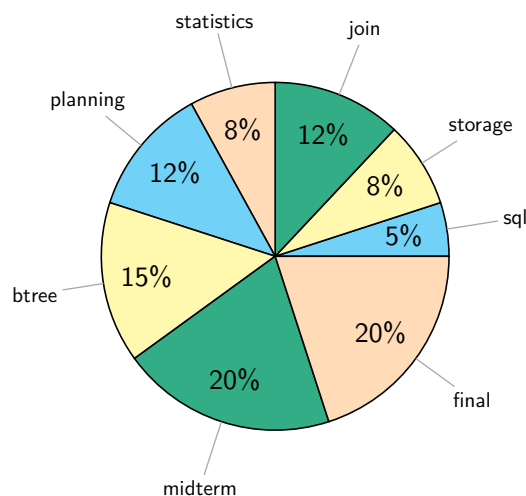
Programming Projects

There will be 6 projects over the course of the term. The first project will be an introduction to SQL and the relational model, and the remaining 5 projects will involve implementing various features of NanoDB, our course's relational database. The projects will be primarily programming assignments. Since we care about you understanding what you're implementing, each of the NanoDB projects will also include a "design document", in which you will discuss your code and answer conceptual questions about the feature you've implemented. Projects will be evaluated on a combination of correctness (both provided and hidden tests), code quality, and design document.

Exams

There will be 2 written in-person assessments: a midterm and a cumulative final. These assessments will be given during lecture time, and may involve code. At least 40% of the questions on assessments will be drawn directly from in-class work or design documents.

AI and Collaboration
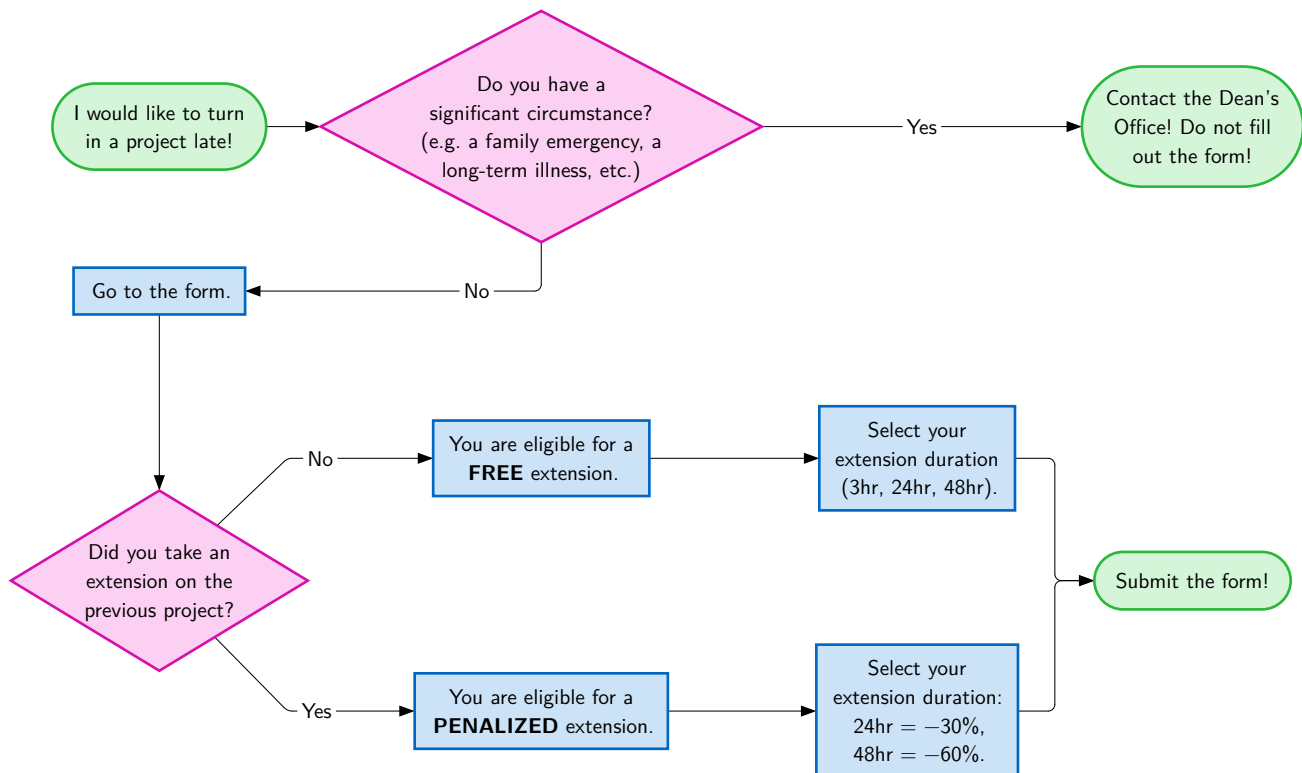
All projects in this course are solo.

Generative AI tools (including, but not limited to ChatGPT and Copilot) are not permitted on Project 0 (SQL), but are permitted on the NanoDB projects. However, you are ultimately responsible for the code you submit, including understanding it, and its correctness. If you use GenAI tools on a NanoDB project, your design document must include an AI usage disclosure and reflection.

See the collaboration table on the website for more information.

Late Policy

We've designed a late policy that is very intentional in providing flexibility while also making sure students do not fall so far behind that they might not be able to pass. Please see below for details. To handle our policy, we have written a tool that will tell you what options are available to you at any given point, which is available on the course website.

Please do not e-mail us asking for an extension. You must use the website form. There are limits and restrictions on extensions which the form outlines. Please read these before you need an extension! This flowchart outlines common scenarios in which a student may need an extension:

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[I would like to turn in a project late!]
    → <Do you have a significant circumstance? (e.g. a family emergency, a long-term illness, etc.)>
        → Yes → [Contact the Dean's Office! Do not fill out the form!]
        → No → [Go to the form.]
            → <Did you take an extension on the previous project?>
                → No → [You are eligible for a FREE extension.]
                    → [Select your extension duration (3hr, 24hr, 48hr).]
                        → [Submit the form!]
                → Yes → [You are eligible for a PENALIZED extension.]
                    → [Select your extension duration: 24hr = −30%, 48hr = −60%.]
                        → [Submit the form!]
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Contacting Course Staff

For all course-related questions, please email cs121@caltech.edu. If there is something particularly sensitive that you would rather only the instructors see, you can email Ethan directly.

Acknowledgements

Special thanks to Donnie Pinkston, the original author of NanoDB; and to all prior students whose contributions have helped develop the codebase to its current state.