

Welcome to CS 4750 Database Systems

Have You Ever Wondered

How is data maintained in a database?

How does the software know where each user left off?

How does the software know when my username and password are correct when I log in?

How secure is my data?

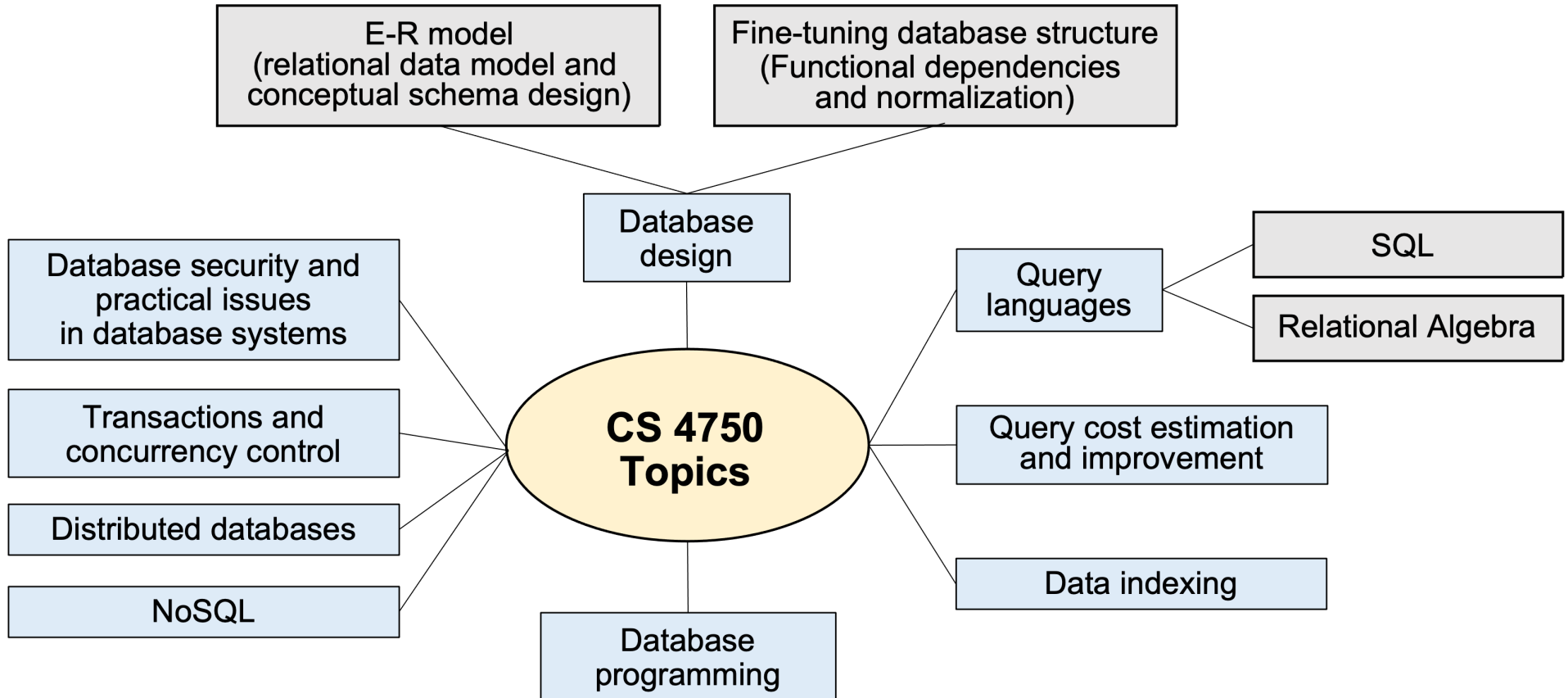
How does a software application interact with the database?

What can be done to make a database system cost less and run faster?



[Ref: emoji by Ekarin Apirakthanakorn]

What This Course is About



Instead of designing any databases, we focus on how they should be design and create **good** databases
Implement a software utilizing databases to provide services

Focus / Not Focus

- What we will **focus / learn**
 - Relational database
 - Focus on centralized, brief overview of distributed databases
 - Brief overview of semi-structured / NoSQL databases
 - Writing good queries that can lead to better performance
 - Designing and developing an effective and scalable database
 - Making use of a Database Management System (DBMS)
 - Integrating a database into a software
- What we will **not** focus / learn
 - How to build a DBMS such as Oracle or SQL-database
 - How to write programs

I Hope to Help You

Design and implement database systems that are realistic, efficient, and effective

Have confidence in learning and applying new technologies to develop database systems and improve the quality of the systems

Get excited about exploring and developing new technologies to improve the quality of database systems

Be able to lead and work effectively in collaborative environments



Explain the technical and practical approaches that database designers and developers use in practice

Analyze and assess the quality of database queries, and use the knowledge of Relational Algebra and cost estimation to improve the quality of database queries

Develop a database system to solve real-world problems and facilitate human daily activities

Recognize optimal database queries and effective SQL to ensure database systems can be efficiently and effectively operated

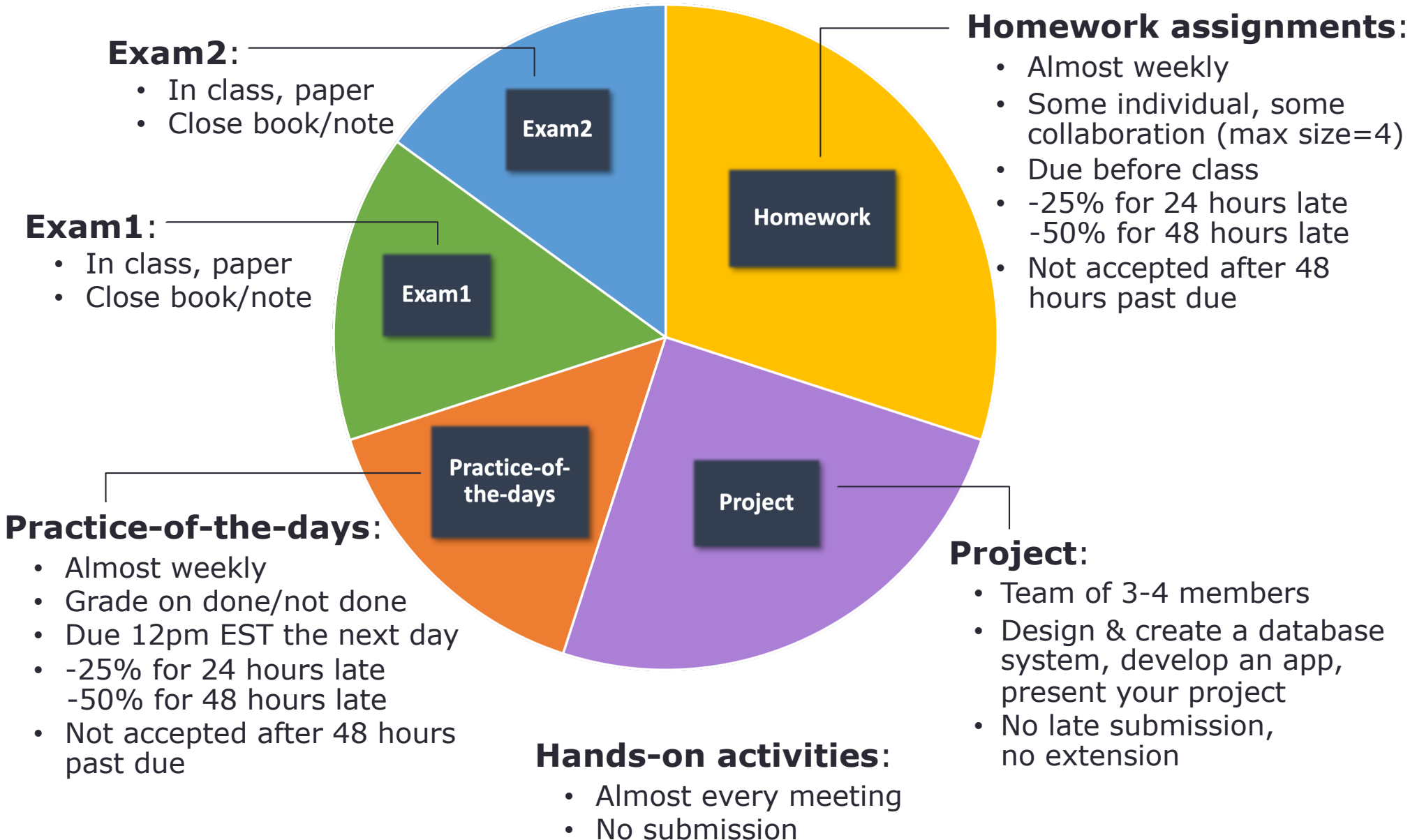
Understand the differences and similarities between relational databases (centralized and distributed) and NoSQL databases and when it is best to use each one

Develop research and inquiry-based skills that can be used to learn, connect, and develop database systems

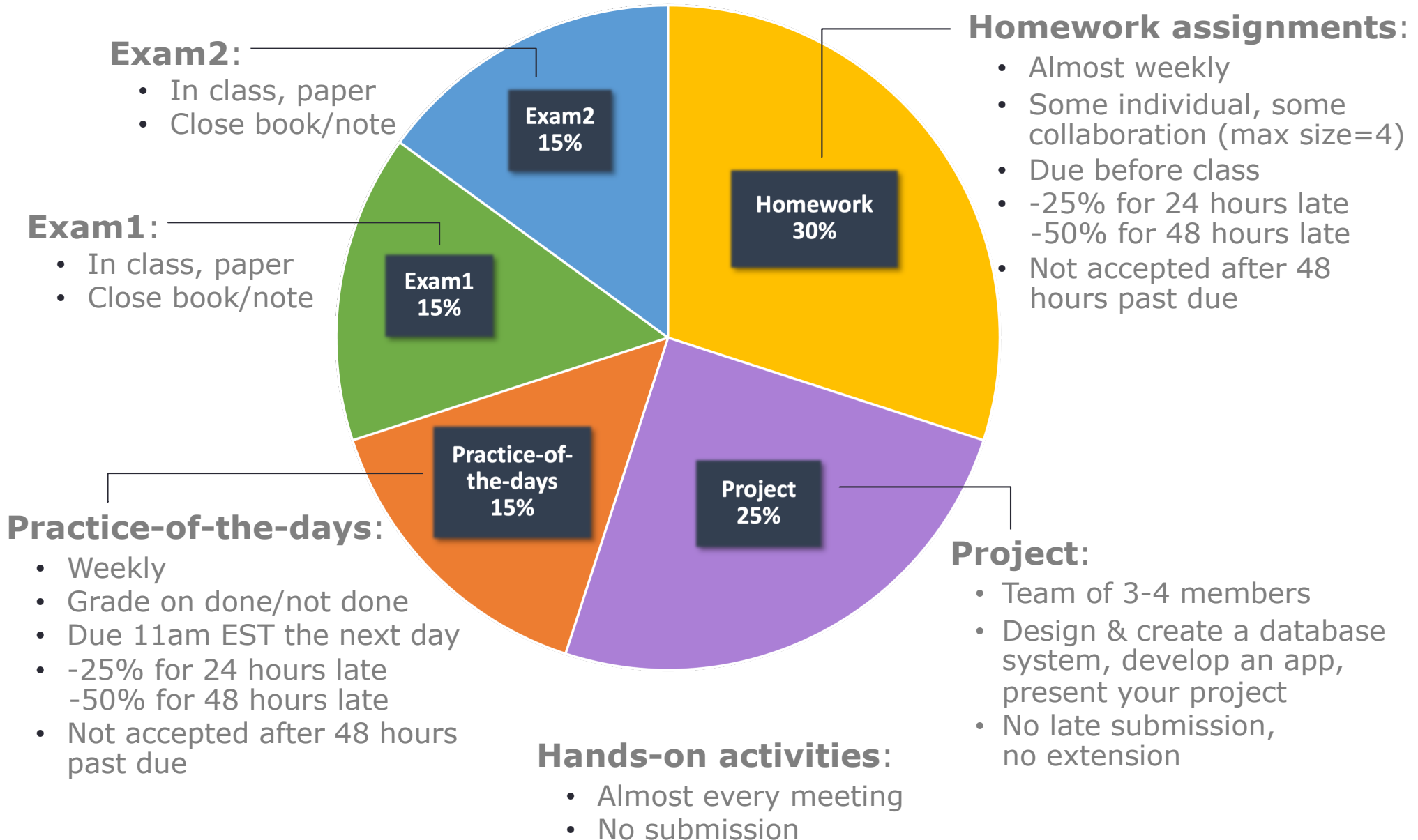
Evaluate your project for compliance with requirements and specifications

Communicate ideas with others within a group learning environment

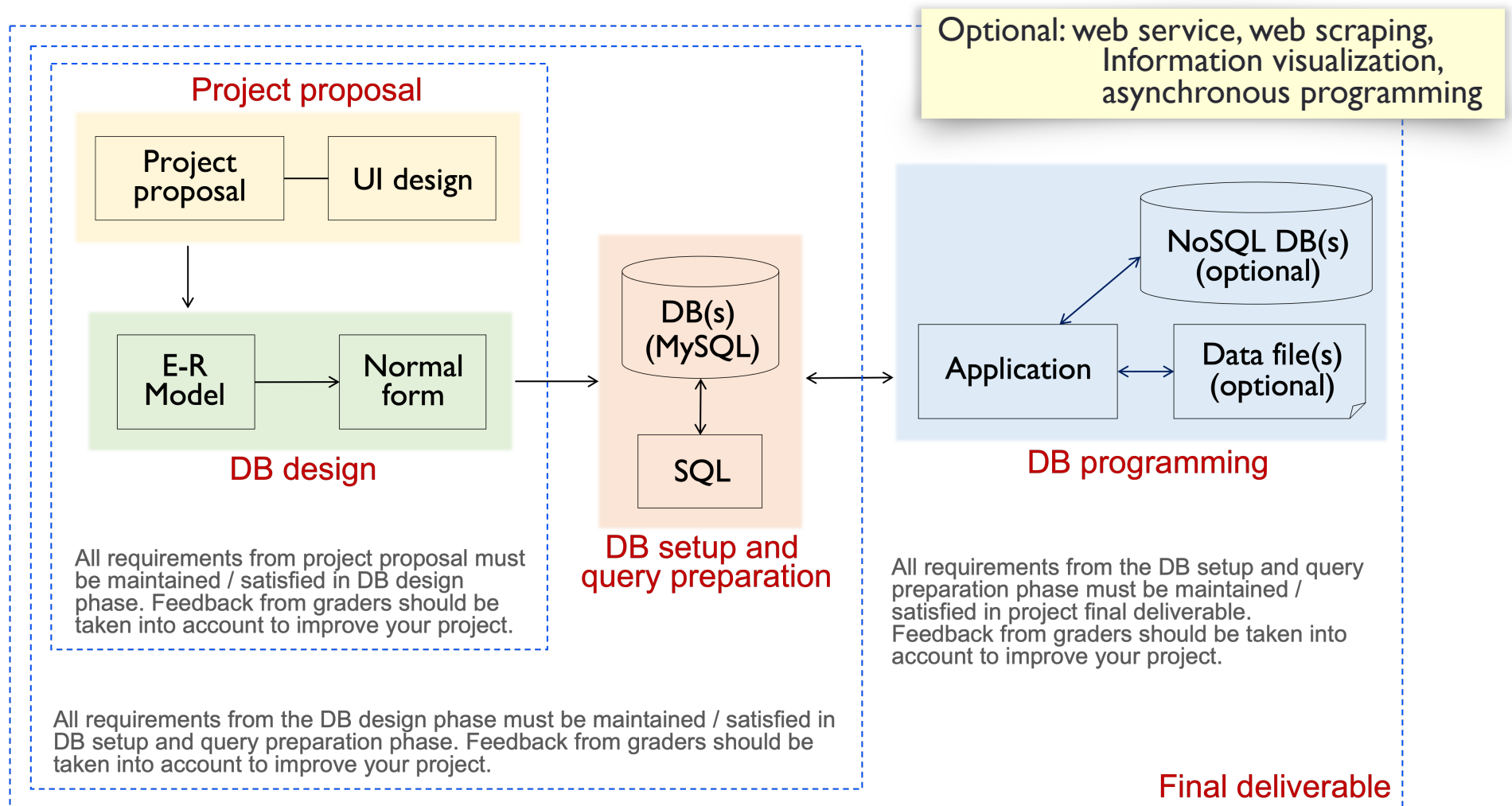
What You Will Do



How Your Learning will be Evaluated



Project Overview



This image shows the order and the specific concepts you will implement. It does not show the design or architecture of the system. You may design your system as a web app or non-web app, using any software architectural style(s) of your choice as long as a relational database is integrated into your app.

Prerequisites

- CS 2150 or (CS 2100 & CS 2120) with C- or better (or COVID CR)
- Knowledge on software/web development, programming skills, programming language(s) needed to complete your project
 - Depend on whether you choose to develop a web-based or non-web-based project, and the programming language(s) you choose
- Ability to pace yourself on a semester-long project
- Software installation and troubleshooting skills

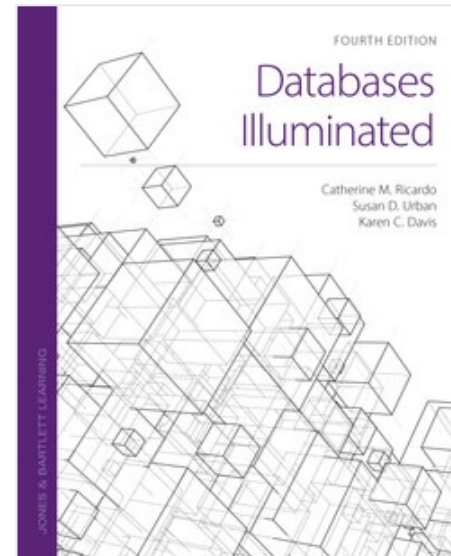
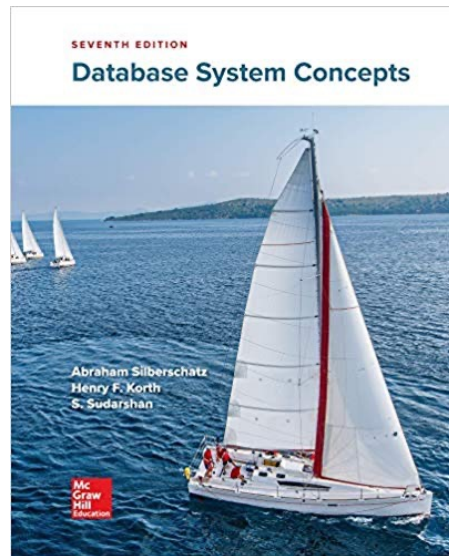
Prerequisites define what you need to know **before** taking a class to succeed in the class. Please do not ask if you can take the class without the prerequisites. I have to advise **against** it

The CS student services staff will monitor and remove students not meeting prerequisites in courses in which they are enrolled

More Info to Help You Learn

Class URL: <http://www.cs.virginia.edu/~up3f/cs4750>

Textbook: No text required, additional references will be provided



Style: In-person, Hands-on activities, lab-style work

Emails: Use your UVA email and check it regularly, include CS 4750

No eating in class

Share Ideas, Get Help, Just Talk

- **Instructor office hours**: days/times on class website
- **TA office hours**: days/times on class website
- **Piazza**: <https://piazza.com/virginia/spring2024/cs4750>
 - You should have gotten an invitation today
 - If not, check your UVA email or check with me
- Questions should be posted to an appropriate thread
 - Answered by instructor, TAs, and your peers
 - Public: general questions and answers
 - Private: Grade/homework-specific questions – instructor and TAs
- Do not email general homework or class questions, **use Piazza**

Learn with “Purpose” and “Vision”

Help yourself learn: <https://forms.office.com/r/gihwuHkjHv>

- To tailor our class to better support and emphasize your differences, energy, and passions, as well as to enhance your strengths
- You are encouraged to be involved in designing and shaping this course to maximize your learning experience, skills, and knowledge
- Please feel free to share your ideas / opinions / suggestions on things that we should do or try to help you learn software testing, using the “Help yourself learn” form

Accommodations

<https://www.cs.virginia.edu/~up3f/cs4750/policies.html#no-extension>

Accommodations: Religious

If you wish to request academic accommodation for religious observance, please let me know via email as far in advance as possible.

If there exists a religious conflict, please mention it.

Do not say *"You are busy"* or *"You have a busy start to the week."* *"Being busy / having a busy schedule / having a busy start to the week"* is **not** a sufficient justification for an accommodation / extension.

"Being busy / having a busy schedule / having a busy start to the week" does not imply a religious conflict.

If you need religious accommodations, please say that you need religious accommodations.

Accommodations: Schedule conflict

If there exists a schedule conflict, please provide the necessary information to determine an accommodation.

Do not say *"You are busy"* or *"You have an unavoidable conflict."* *"Being busy / having a busy schedule / having an unavoidable conflict"* is **not** a sufficient justification for an accommodation / extension.

It is important to note that being busy with other courses (homework assignments, projects, exams, quizzes, tests, ...) is **not** a sufficient justification for an accommodation / extension. Please consider adjusting or planning your time management.

Accommodations: Things in life and special circumstances

If you believe that circumstances warrant an extension or exception, come talk to the course instructor and we will resolve the situation as best we can.

Additional Things to Know

Regrade request: Submit to Gradescope

- Regrade the “entire” work (exam, assignment, project, POTD)
- Correct any grading mistakes
- May result in either an increase or a decrease in grade
- Not try to scare off students whose work was graded incorrectly, but try to avoid frivolous requests

Check schedule page regularly

- In case of emergency, email & post update on the schedule page

"You" are the Main Driver!!

"You" are the main driver of your learning success.

Your engagement and participation is the most important aspect of your learning experience.

You are encouraged to do all the activities, try all concepts, experience all frameworks ... and do beyond the project's minimum requirements!!