CIS 8040

Fundamentals of Database Management Systems

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COURSE INTRODUCTION

Course Learning Objectives

Understand basic concepts and principles of database management systems.

Create a valid conceptual model of a database application.

- Chen's notation
- Crows Feet notation

Design and implement a relational database (Oracle).

Use SQL queries to create and query a complete database.

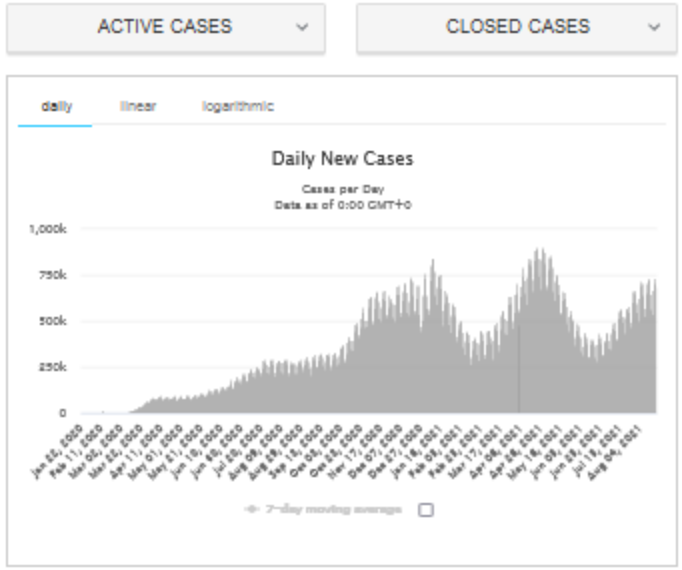
Understand the major aspects of database administration and database applications.

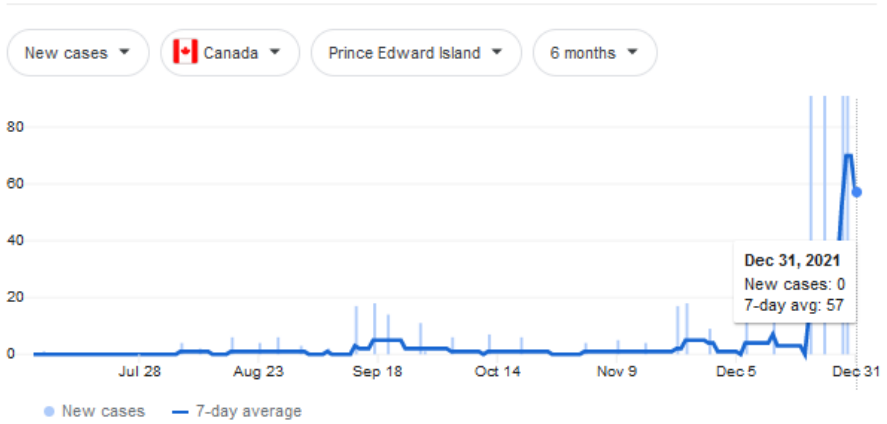
Understand data warehouses and their role in business intelligence.

Appreciate trends in database technology and use (as time permits)

- Big data management
- Disruptive technologies
- Privacy, security, ethics

Data: This course is about data





- How do we collect data?
- How do we represent data?
- How do we use data?

COVID-19 Coronavirus Data Dashboard

Brought to you by: informationisbeautiful + Univers Labs + NUEKER

Why do we care about data?

- Data as basis for decision making
- Drivers to data acquisition
  - Automated data capture – how?
  - Telecommunications (removes distance)
  - Powerful processing capabilities

What is a database, exactly?

A database is a set of data that has a *regular structure* and is *organized* in such a way that a computer can easily *retrieve the desired results*.

(Well, a good one is, anyway)

Important: Need to be able to store and retrieved data need.

Requires: data availability and data manipulation capabilities

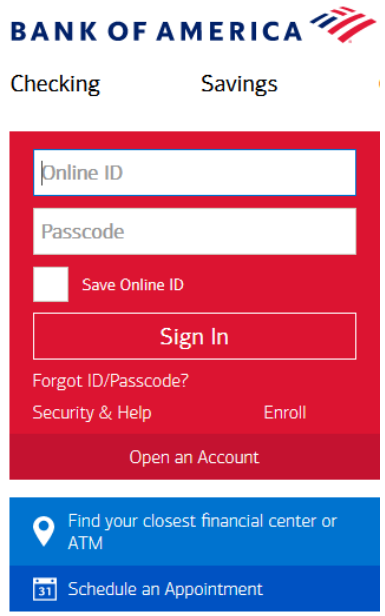
What is a database management system (DBMS)?

Software package
- Create, implement, and use database
- Oracle (GSU accounts for students)

Tools
- Querying, security/privacy, handling multiple users

This course
- Design, develop, and use a database
- Understand the notion of “data as a corporate asset”

Database System



Database Application (e.g., banking)

Database Application

Database Management System (DBMS) (software)

Raw data must be protected.

Database (raw data; important to protect data)

Uses of Database Management System (DBMS)

Archive data
- For later use, trend analysis, legal requirements

Transactions (OLTP – Online Transaction Processing)
- Point of Sale (POS)
- Banking

Analysis (OLAP – Online Analytic Processing)
- Business Intelligence/Data Mining

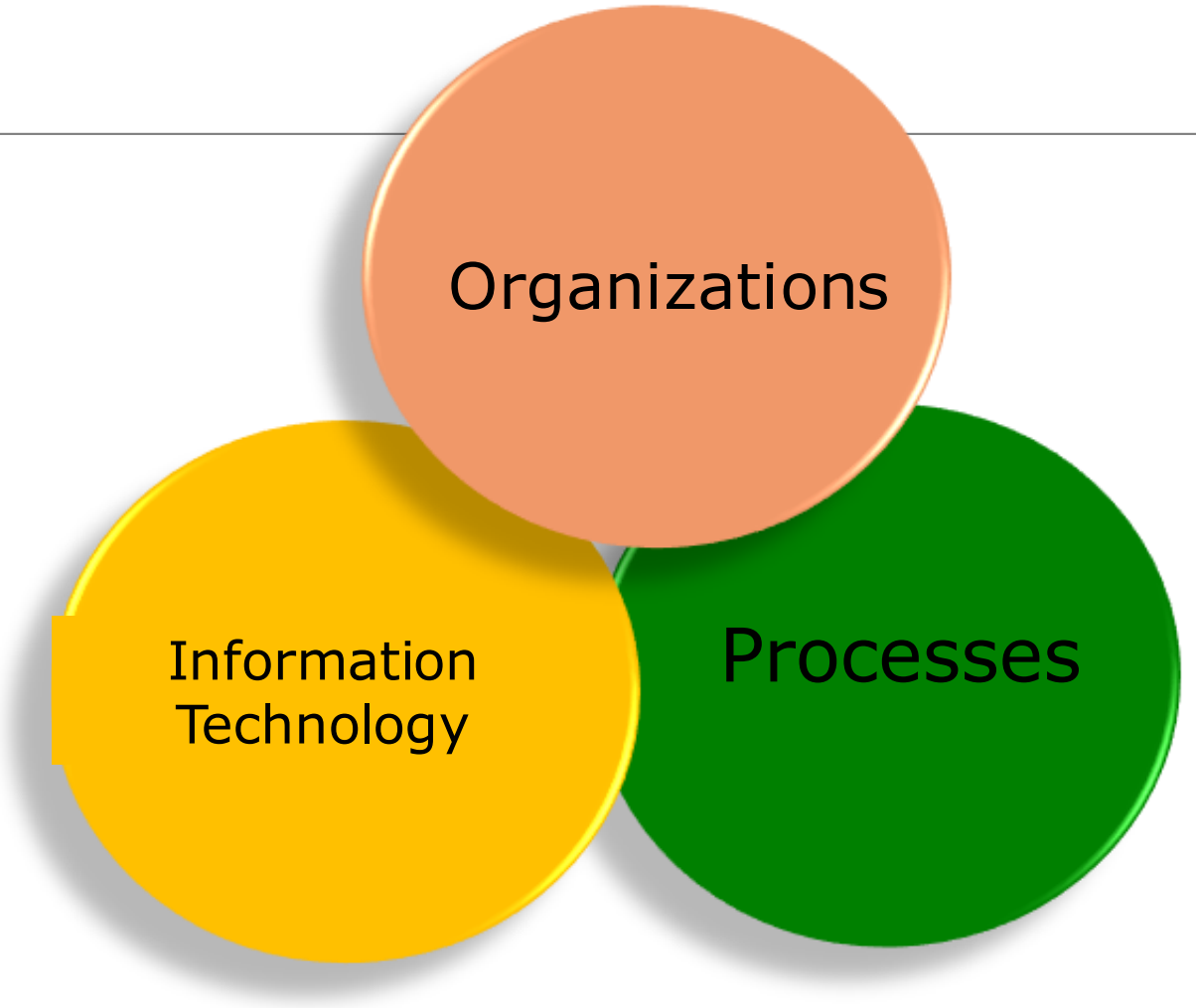
Real-time Data
- GPS

Applications

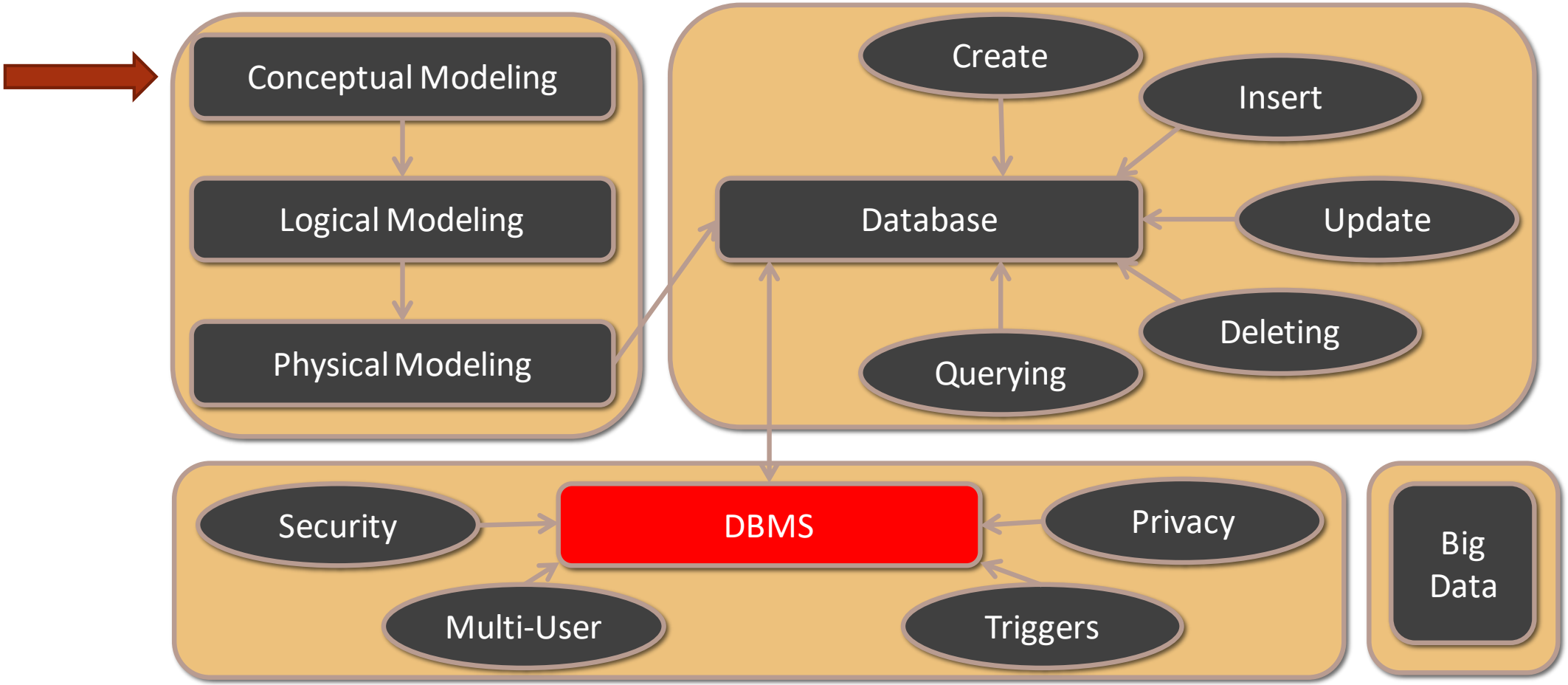
Many, many applications for business and personal applications.
Examples?

Business Today

- Organizations, information technology, and processes are all inter-dependent
- Change in one affects another
- Example: information technology can support a virtual organization and change the processes by which organization operates



Course Overview



Textbook

Kroenke, D., & Auer, D. J. (2018). *Database processing: Fundamentals, Design, and Implementation*, 15th Edition. Prentice Hall

- Alternatives for acquiring textbook (e.g., rent)
- **Secure access to textbook by Session 2.**

Lectures

Outline in syllabus

Deviations **possible** (probable)

Please ask questions if you need help

Class Schedule

Session 1	4 January	Introduction to course The nature of data Introduction to conceptual modeling	Read syllabus Chapter 1 (pp. 2-17, summary p.30)
Session 2	11 January	Conceptual modeling (Chen and Crow's Feet notations) Min/max cardinalities Data modeling process	Chapter 5 (pp.212-242, selected); pp. 245-251 Highline University Example
Session 3	18 January	Logical design Data warehouses and data mining Relational model characteristics Quiz 1 (closed book)	Chapter 6 (pp.267-290) Chapter 2 (pp. 38-40)
Session 4	25 January	Database Design Transformation of conceptual models to logical models Midterm examination (closed book)	Chapter 6 (pp. 295-296)

Class Schedule (Cont'd)

Session 5	1 February	SQL: DDL / DML Single table queries Multiple table queries	Chapter 2 (pp.61-63; pp. 66-106, selected commands) Due: Assignment 1 (4:00 pm)
Session 6	8 February	Reverse engineering Disruptive technologies Quiz 2	Chapter 7 (pp.324-338) (p.340-351) Chapter 7 (pp.400-408)
Session 7	15 February	Big data, data privacy	Due: Assignment 2 (4:00 pm)
Session 8	22 February	Course wrap-up Brief presentations Final Examination (closed book)	Due: Brief (4:00 pm)

Communication

GSU email is the official communication channel between the instructor and the students. Please do not use the iCollege's email application for communicating with the instructor. The email address assigned by iCollege is not recognized by the GSU Outlook email server. Thus, email messages initiated from iCollege cannot be replied.

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(Might get reply from mobile.)

Office Hours: By appointment. Before/after class.

QUESTIONS

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