Week 1

Introduction to Data Design

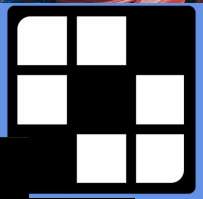
Matthew Bebis

UNIVERSITY of GUELPH

NISSAN

BALATRO

CALL OF DUTY

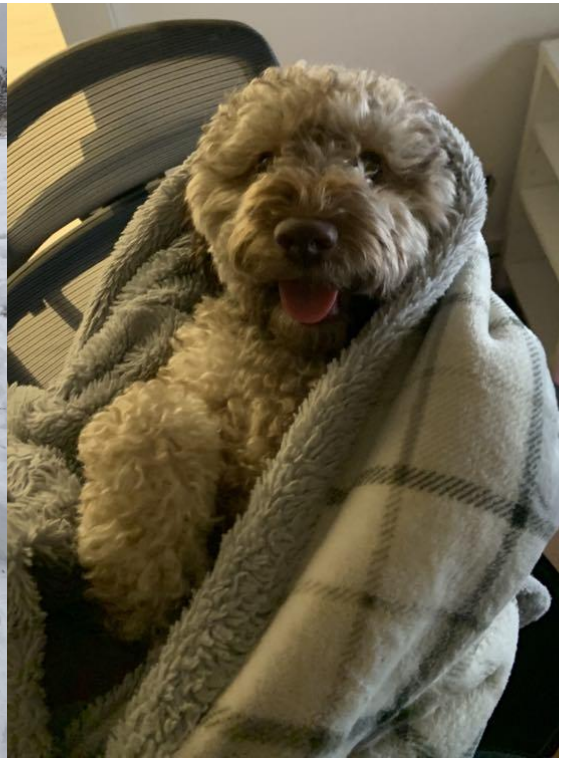


New York Times Bestselling Author
SHIRLEY JACKSON
BATMAN
THE LONG HALLOWEEN
AGATHA CHRISTIE
AND THEN THERE WERE NONE
JULES VERNE
THE SHINING
ANTHONY DOERR

TORONTO
TORONTO
TORONTO MAPLE LEAFS

WORTH
Official League
SOFTBALL

Chewbacca



Class Expectations

1. Ask questions if you are confused
2. Try not to distract your classmates
3. During lessons, use technology only for legitimate class activities (note-taking, assigned tasks)
4. Participate when asked

Instructor Expectations

What do you expect from me?

This Week

- Introduction to Data Design
- Lab 1 (5%)

The Need for Data Design

- To understand what and why we want to create software
  - To build a movie website, information above movies should be defined first
- By defining data needed first, we gain the ability to make future decisions about how to build/design our software

Data	Raw values	4164390000
↓		
Information	Data with context	416-439-0000
↓		
Knowledge	Ability to make decisions	

What is Data?

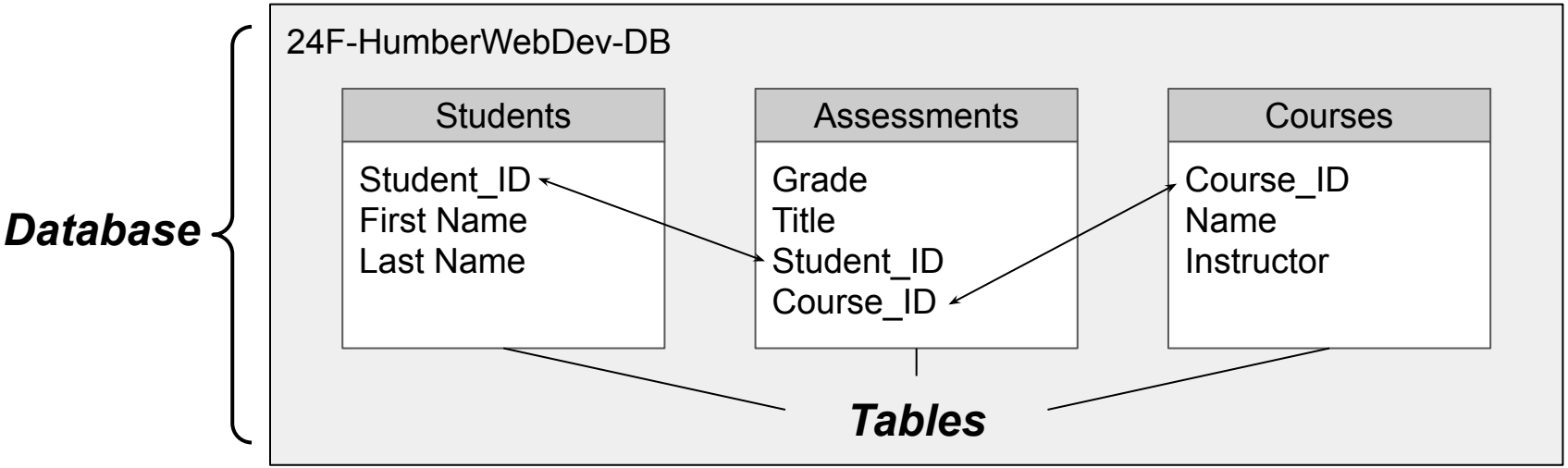
- Data is a collection of information
- An individual piece of information is a ‘datum’
  - Datum is the singular form of data
- Every application utilizes data in some way and that data usually needs to be stored somewhere
- **Databases** are the solution for storing data

What is a Database?

- A database is a structured way to store **data**
- Databases are systems used to **access**, **manage**, and **update** data
- There are many types of databases, each structuring data in specific formats
- One of the most common is the **relational database**
    - Relational DBs (databases) are also the main focus of this course

Relational Databases

- Relational databases hold **tables**
- Tables store data in rows and columns (Just like a spreadsheet!)
- Tables within a database may hold related data, hence why these databases are **relational**



Tables

- Tables should represent an **object, subject,** or **concept**
- Each **column** represents an **individual** data **property** of the object
  - Ex: a student table would have a student ID and a name

Students
Student_ID First Name Last Name

- Each **row** represents an **individual instance** of that represented **object**
  - Ex: an individual student would have an id “*n12345678”* and name *“George Springer”*

Student_ID	First Name	Last Name
n12345678	George	Springer
n09876543	Auston	Matthews
n00000000	Natalie	Spooner
n99999999	Lorenzo	Insigne

Relational Databases Example

24F-HumberWebDev-DB

Students
Student_ID First Name Last Name

Assessments
Grade Title Student_ID Course_ID

Courses
Course_ID Name Instructor

Student_ID	First Name	Last Name
n12345678	George	Springer
n09876543	Auston	Matthews
n00000000	Natalie	Spooner
n99999999	Lorenzo	Insigne

Course_ID	Name	Instructor
HTTP5126	Database Design & Development	Matthew Bebis
HTTP5122	Front End Web Development	Sean Doyle

Grade	Title	Student_ID	Course_ID
99%	Lab 1	n12345678	HTTP5126
66%	Lab 1	n09876543	HTTP5126
88%	Lab 1	n00000000	HTTP5126
77%	Lab 1	n99999999	HTTP5126
100%	Quiz 1	n12345678	HTTP5126
60%	Quiz 1	n09876543	HTTP5126
80%	Quiz 1	n00000000	HTTP5126
90%	Quiz 1	n99999999	HTTP5126

Designing Databases (Ex. Social Media)

- What data do we need to show the user?
- How can we organize the data?
- What data relates to a single object, subject, or context?
- What data is connected?

Next Week

- Introduction to SQL
- Accessing Data
- Lab 2 (5%)