Week 1 Questions

1. What is the difference between 'data' and 'information'?

Data: Raw Elements. No ability to take action

Information: Data in context. People can take action on the information.

1. What is meant by 'organize or die'?
2. What are the components of the '3-tier architecture'?

1-tier: mainframe where everything is stored (pre-1980)

2-tie: Client and server. Can have a computer at home and can connect several clients to a server and send files. (pre-1980)

3-tier: Client, Middle tier, and Server (1990)

N-tier: Have multiple middle tiers (analyze complex business situations). (2000)

1. What are the advantages/disadvantages of a 'paper-based' database system?

Advantages: Quick and Easy. Customizable. Cheap.

Disadvantages: Cannot scale. Need to explain your customized system to anyone else that gets involved in the system.

1. What are the advantages/disadvantages of a 'hierarchical' database system?

Advantages: Follow 'paper-based' database system. Easy to transition from 'paper-based' database system. Customizable.

Disadvantages: Very expensive in the 1960s. Have redundant data. Cannot scale. Hard to update.

1. Who is the person that first articulated relational database theory?

Edgar F. Codd

1. What are the advantages/disadvantages of a 'relational' database system?

Advantages: Fast. We have fewer redundant data because we are indexing integers very quickly instead of bringing in large-scale random data.

Disadvantages: Counter-intuition, Hard to think, Need to learn before you know how to use it

1. What are the clauses of a basic query in SQL?

Select From Where Order By Group By

1. What is meant by SDLC?

SDLC stands for Systems Development Lifecycle.

1. What are some common methodologies?

Waterfall, Agile, Lean

1. Why do we have different methodologies?

Because every industry has different peculiarities that we recognize it might lead us to the wrong pass. We have to be really close to customers because requirements change different feature sets get prioritized at different times in software.

We need different methodologies to improve the efficiency and the probability that we successfully build an application that people can use.

1. What are the different phases of a Systems Development Lifecycle?

Planning, Analysis, Design, Build, Maintain

Quiz 1 Quesitons:

1. Discuss the purpose and benefits of following the Systems Development Lifecycle.
2. Explain what the instructor means by the phrase ‘organize or die’.

Continual optimization through learning and analysis

The individuals ,organizations, societies that are aware of the systems around them can predict change. Therefore allowing to make decisions to take over opportunities.

Planting survival of the fittest from Charles Darwin

Human learning base d on organizing & analyzing

Those that were effective at building systems survived

This is important in a database class because we can organize our analysis and determine something so that we learn.

Lots of uncorrelated data because we are capturing more data

1. Explain the history of the management of data over the past 4,000 years as presented in lecture; how and why where certain organizational structures chosen?

Paper based systems

* thousands of years
* Still alive today
* Examples:
  + Cash
  + Libraries
  + Contracts
  + Phone books
  + Hospitals
* Benefits
  + Easy to use
* Problems
  + Vulnerable
  + Costly
    - Hire more people to do manual updates
    - Cant analyze large amounts of paper therefore no learning

Week 2 Questions

1. What are the distinct phases of database development?
2. What are the goals and objectives of each database design phase?
3. What are the common symbols used with data modeling?
4. What is the purpose of Normalization?
5. What are the characteristics of 'un-normalized' data?
6. What is meant by 'fully normalized' data?
7. What is the purpose of a primary key?
8. What is the purpose of a foreign key?
9. How do primary keys and foreign keys 'work together’?

Lab 1 Due Jan 14

Quiz 1 Jan 20

* Theory
* Lecture
* No coding
* 45-60 minutes
* Review study questions

Data Modeling

* Communication tool
* Defines what is needed from a data perspective

Questions:

* Who’s gonna use the database?
* What decision(s) are they gonna make?
* Ex: Spotify
  + Music streaming service
  + Probably 15-20 million people using it
  + Who’s using it? People looking for songs to download and listen, advertisers, suppliers, manufacturers (of things related to music like headphones and stuff), musicians
  + What do they need to know? What are the top songs? Per region? Per genre? How much will things cost? How many times will my ad get played (advertisers)? Demographics (suppliers)? How many times will my song get played (musicians)?

Make Personas

* Make their last names something that is part of their persona
* Use alliteration to make it easier
* Make note of what percentage of the users each of the personas represent
* What are their motivations?
* How the database helps them achieve their goals

Reminder: SDLC

* Planning
* Analysis
* Design
* Build
* Maintain

Building a database is in the design phase

* Conceptual
* Logical
* Physical (build phase)

Conceptual Design

* Learn about business, market segments, users
* Interviews, observations, research
* Roughly 3 weeks

Brainstorming Diagram

* Biggest Deliverable
* Ex: Spotify (write down what information you need to know about each)
  + Recording
    - For example: date/duration/name
  + Customer (name, age, gender, state, phone, begin date, subscription)
  + Genre (name, maybe description)
  + Country
  + Artist
  + Album
  + Playlists
  + Subscription
  + Instruments
  + Song
  + Studio
  + Duration
  + Download
  + Stream
* Connect the ideas
  + Sometimes new boxes (tables) are needed
  + Ex: download and stream can be rows of a table called access type

Connections

