CMPSC 431W
Database Management Systems

Conceptual Database Design

ER Model

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Review

- Database – Collection of data to support applications.
- Relational Model – Common data model used by DBMS
- Relational Algebra/Calculus – Formal query languages
- SQL – Concrete Way (DSL) to talk with DBMS

- Given an application, how do we design the database to support it?

Motivation

- How to figure out this **database design**?
  - Customer = {customerID, firstName, lastName, income, birthDate}
  - Account = {accNumber, type, balance, branchNumber$^{\text{FK-Branch}}$}
  - Owns = {customerID$^{\text{FK-Customer}}$, accNumber$^{\text{FK-Account}}$}
  - Transaction = {transNumber, accNumber$^{\text{FK-Account}}$, amount}
  - Employee = {ssn, firstName, lastName, salary, branchNumber$^{\text{FK-Branch}}$}
  - Branch = {branchNumber, branchName, managerSSN$^{\text{FK-Employee}}$, budget}
- What **tables** to create?
- Which **attributes** should be added to each table?
- What are the **relationships** between tables?
- What **constraints** that tables have to follow?