**Fundamentals of Database Systems**

* Traditional Database Applications
  + Based on a fixed schema that is static in nature
    - Checking account
    - Library catalog
    - Inventory of grocery items
* Multimedia Databases
  + Collection of data that stores information on media
    - text, graphics, images, animations, video, audio
  + Three classes
    - Static Media
      * Time-independent (image and graphic object)
    - Dynamic media
      * Time-dependent (audio, video, and animation)
    - Dimensional media
      * 3D game and computer aided drafting programs
* Geographic Information Systems (GIS)
  + Stores and analyzes maps, weather data, and satellite images
* Online Analytical Processing (OLAP) Systems
  + Used to extract and analyze \useful business information
  + Supports decision making
  + Used with Data warehouses
* Database
  + Collection of related data
    - Logically coherent with some inherent meaning
  + Represents some aspect of the real world
    - Called miniworld or universe of discourse (UoD)
  + Designed, built, and populated for a specific purpose
    - Intended group of users
  + Changes must be reflected asap
* Database Management System (DBMS)
  + Collection of programs that enables users to create and maintain a database
  + General purpose software system
    - Facilitates these processes
      * Defining
        + Involves specifying data types, structures, and constraints of the data to be stored in the database
      * Constructing
        + Process of storing data on some storage medium
      * Manipulating
        + Includes functions such as querying to retrieve specific data
      * Sharing
        + Allows multiple users and programs to access the database simultaneously
* Query
  + Causes data to be retrieved
* Transaction
  + Causes data to be read and to be written into the database
* Program-data Independence
  + The structure of data files is stored separately from the access programs
* Program-operation independence
  + Operation on data with application programs
    - Called by names and arguments
    - Regardless how the operation is implemented