* Database (entities, relationships)
  + collection of data
* Database Management System (DBMS)
  + software to maintain and utilize large collections of data
* Historical Perspective
  + first general-purpose DBMS (Integrated Data Store) designed by Charles Bachman
    - formed basis for the *network data model*
  + Information Management System (IMS) by IBM
    - formed basis for an alternative data representation framework called the *hierarchical data model*
  + Edgar Codd -> *relational data model*
* Advantages of DBMS
  + Data Independence
    - abstract view of the data that hides details of data representation and storage
  + Efficient Data Access
    - utilizes variety of sophisticated techniques to store and retrieve data efficiently
  + Data Integrity and Security
    - enforce integrity constraints (access controls that govern what data is visible to different classes of users)
  + Data Administration
    - experienced professionals who understand the nature of the data can organize the data representation to minimize redundancy
  + Concurrent Access and Crash Recovery: