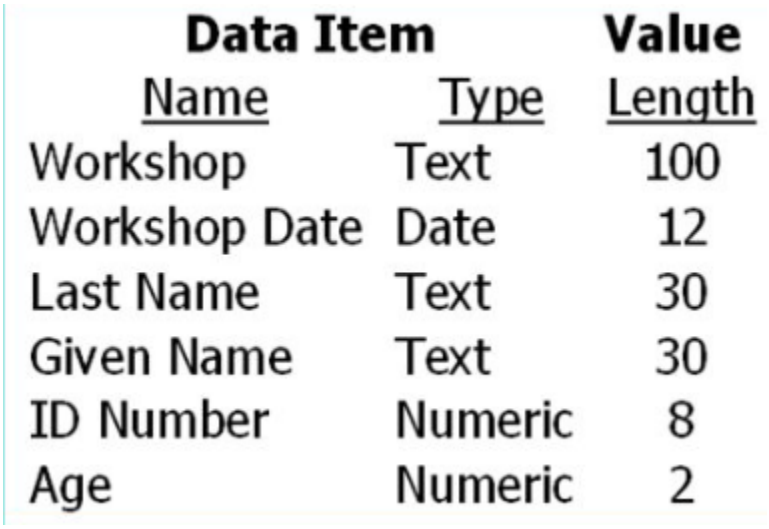
OVERVIEW OF DATABASE SYSTEMS

- Define key terms
- Compare conventional file systems and database system
- Identify typical components of a database
- Differentiate relationship types
- Draw ERDs for business situations

- Introduction
    - They simply performed regular record-keeping functions
    - These were called *file-processing systems*
    - Electronic version of the file system
        - Put the files in the folder and you manage
    - **File systems**
        - Organizational data were kept in numerous files
        - Information in a folder may be the same as records in a computer
        - Files are created and managed independently
            - Messy asf desktop lmfao
        - Application programs are used to manage the interrelationships of files when there is a need to link data from different files.
            - Each person, each student… each
            - Related to class
    - Technology Today
        - Organizations today make use of different types of information systems that require well-organized database systems
            - Marketing, Airlines, Hospitals
            - Schools Groceries
            - Credit Card
    - Database
        - **Organized collection** of **logically related data** that can be processed by multiple application systems and **can be shared by multiple users**.
    - Data
        - Traditional Definition
            - Facts concerning objects and events that can be recorded and stored on computer media
        - The traditional definition focused on **Structured Data**
            - Numeric values, characters, dates
            - Stored in tabular form
        - Traditional does not consider unstructured data
            - documents, maps, photos, audio
        - Updated definition
            - Stored representation of objects and events that have **meaning and importance** in the user's environment

        - Not gonna store trash T_T
- **There is a difference between DATA and INFORMATION**
    - Information
        - Already processed data to increase the knowledge of the person who uses the data
        - Data on its own, seems random and may not be understandable
            - Information, ie data that has been processed and given context, can be understood
- Metadata
    - Data that describes the properties or characteristics of end-user data and the context of that data
    - 

Data Item		Value
Name	Type	Length
Workshop	Text	100
Workshop Date	Date	12
Last Name	Text	30
Given Name	Text	30
ID Number	Numeric	8
Age	Numeric	2

- Database system
    - composed of:
        - The data stored in the database
        - The DBMS
        - The software and applications
        - The hardware
        - The people
    - The software includes the DBMS, CASE tools, application software and utilities, report writers, user interface, operating systems, etc.
    - People include data and database administrators, system developers, programmers, system administrators, etc.
- Scenarios
    - Think of how these scenarios would take place in a situation that does not use a database system
    - Then think of how the scenario would be with a database system
        - Changing a student's home address
        - retrieving a selected list of student information
        - Revising a form or report (like adding a new field)
            - Have to go to the each folders and change each folder

    - **File systems:** disadvantages
        - program - data dependence
        - Data redundancy: waste of storage space, multiple entries of the same data item
        - Data inconsistency and poor data control: lack of integrity, synonyms, homonyms
        - Limited data sharing
        - Lengthy development times
        - Excessive program maintenance
    - **File system**: advantages
        - Program-data independence
        - Minimal data redundancy
        - Improved data consistency
        - Improved data sharing
        - Increased productivity of application development
        - Enforcement of Standards
        - Improved data quality
        - Improved Data accessibility and responsiveness
        - Reduced Program Maintenance
        - Improved Decision Support
    - **Limitations**
        - Specialized personnel
        - installation and management costs and complexity
        - Conversion costs
        - Need for explicit backup and recovery
        - organizational conflict

Features of a DBMS

- Linking Mechanism
    - Allows related entities in a database to be linked together
    - No need to keep multiple copies of the same data
    - No redundancy in terms of flowing records
- Data dictionary
    - Describes how structure of data and how they are to be used
    - Contains metadata, or data about data
    - Also known as a system catalog
        - A system-created database that contains the characteristics and contents of user-created databases
- Query Language
    - language that is used to retrieve selected data from a database
    - Used by end-users for ad-hoc queries
    - Structured Query Language