**Work through the following materials, recording answers to the questions so that you can bring them to class and submit them for review.**

1. **Chapter 1**
   1. **Compare and contrast *data*, *databases*, *database (management) systems* and *information systems*.**

Data are pieces of information that can take multiple formats, whereas databases are (potentially) massive collections of persistent pieces of data stored and organized in a meaningful way.

A DBMS is a piece of software that keeps track of and allows access and manipulation of data stored in a database.

An information system is a more broad term describing the value of a data system to an organization, its data, *and* the way its data is communicated.

* 1. **Compare and contrast database systems with the following, using the main characteristics of the database approach in your discussion.**
     + **data structures and algorithms**

A data structure is a means of storing data in a particular format that is also self-descriptive, and defines operations that can be done on it. Additionally, a data structure may not be self-descriptive, apart from the fact that it may show what type of operations can be performed on it (A sort of API). An algorithm is a means of acting upon data in a particular way that modifies it or produces new, meaningful data from it.

* + - **traditional file systems**

A traditional filesystem stores data in organized pieces and arranges them in a tree structure within directories. Files are addressed in their system and the addresses are always known by the system. Databases are often very shared and there is a separation of data from programs. They both use permissions and access levels.

* 1. **Identify the stakeholders of database systems.**

The companies who own the data and the customers who rely on their data being stored securely.

1. **Chapter 2**
   1. **Explain the significance of the categories of data models. Which type of model is displayed in Figure 2.1?**
   2. **Explain the structure and significance of the three-schema architecture.**

The three schemas give a plain language description of the database's internal schema, and describes how it handles its own data, whereas the external schema describes the way that database interacts with an application or the user. The three schema view also describes how these two schemas interact.

* 1. **Explain the tiers used in a typical web-based information system.**

Frontend: The view that is rendered by a user's browser, and presents them with human-readable data.

Application Tier: The software that interacts with the user and controls the connection between the user interface and the

Backend/Business Tier: The server software between the users machine and the database. Typically controls what information is sent to the user and what is requested.

Data Access Tier: The DBMS and the storage of the data that is accessed and modified by the application