Homework – 9
(10 points)

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1. What is a data structure?
   A data structure is a framework for organizing, storing, and managing data that consists of files or tables that interact in various ways and contain data about people, places, things, or events.

2. Briefly describe the components of a DBMS.
   Users – work with predefined queries and commands but can also access stored data using query languages.
   Database Administrators – responsible for DMBS managements and support. They are concerned with data security and integrity, preventing unauthorized access, providing backup and recovery, auditing, maintenance, and supporting whatever the user may need
   Related information systems – provide input to, and require data from, the DMBS. No human intervention is required for communication

3. List the major characteristics of web-based design.
   Global access, ease of use, multiple platforms, cost effectiveness, security issues, adaptability issues

4. Explain primary key, candidate key, secondary key, and foreign key.
   Primary keys are a field or combination of fields that uniquely identify a particular member of the entity. Any of those fields that can serve as a primary key is called a candidate key. Foreign keys are fields in a single table that must match a primary key field in another table to establish a relationship between the two. Lastly, a secondary key is a non-unique key that can be used to access or retrieve records from a database.

5. What are ERDs and how are they used?
   Entity Relationship Diagrams are models that show the logical relationships and interactions among entities in a system. They provide an overall view of the system and show a blueprint for creating the physical data structure.

6. How do you convert an unnormalized design to 1NF? In your answer, refer to specific pages and figures in this chapter.
   Converting an unnormalized design to 1NF requires the table's primary key to be expanded to include the primary key of the repeating group. As shown in Figure 9-20 on page 285, a table showcasing two orders that have repeating groups can be normalized by including the repeating group's primary key with the table's primary key, thus eliminating the repetition.

7. How are codes used in data design?
   Codes are used in data design to simplify output, input, and data formats. Examples are student ID codes, postal codes, and zip codes.

8. What is data warehousing and data mining?
   Data warehouses are integrated collections of data including seemingly unrelated information but can be used to provide rapid access to overall structure information.
   Data mining is the use of software to look for data patterns relationships that can help a company identify potential customers or profitable advances.

9. How would a specific date, such as March 15, 2019, be represented as an absolute date?
   The specific date would need a base date to compare to so that the specific date can have a calculated number of days since the base. For instance, if the base date here is January 1, 2019, the specific date of March 15, 2019 would have an absolute date of 79.

10. How are permissions used to control access to data?
    Permissions are used to assign privileges to different tiers of users. Users like employees can have permissions for read-only access to data, owners can have permissions to read and write highly sensitive data, and customers will not have the same permissions and therefore cannot view sensitive information.