**Chapter 9a - Review Questions**

1. **Explain the main differences between a file processing system and a database system.**

* File processing is an older approach where data is stored in one or more separate files. This type of system has some problems. First of all, common data that is needed in multiple information systems is stored in several places (data redundancy).This requires more storage space and is more expensive to maintain. The second issue can occur if updates to the data are not applied to all instances of the file (data integrity). If the data is only changed in one location, it can cause inconsistencies and result in incorrect information in the second system. The last issue with this type of system is the rigid data structure of a typical file processing environment. In this environment, information from many business units and departments are required, which can be slow and inefficient.

In a database system, all of the tables are connected by common fields. It offers timely, interactive and flexible data for the user. A database system is scalable, better support for client/server systems, allows for better utilization of hardware resources (economy of scale), flexible data sharing, enterprise-wide application, stronger standards, better security, increased productivity by programmers, data independence and controlled redundancy. Data is stored in a set of related tables, so it does not need to be duplicated in numerous locations. When data is updated in a database system, it is updated throughout the system at once. The same data is available to anyone that needs it, when they need it and where they need it very quickly.

1. **What is a DBMS? Briefly describe the components of a DBMS.**

* A **DBMS** (Data Base Management System) provides an interface between a database and users who need to access the data. The DBMS consists of the following components:

**Interfaces for Users, Database Administrators, and Related Systems –** When data is requested from the system, the DBMS processes the request, manipulates the data, and provides a response.

**Data Manipulation Language –** controls database operations including storing, retrieving, updating, and deleting data.

**Schema –** This is the complete definition of a database, including descriptions of all fields, tables, and relationships.

**Subschema –** a view of the database used by one or more systems or users. It defines only the portions of a database that a particular system or user needs to see or is allowed access to.

**Physical Data Repository –** basically the data dictionary, which also contains the schema and subschemas.

1. **Describe a primary key, candidate key, secondary key, foreign key, and common field.**
2. A **primary key** is a field or combination of fields that uniquely and minimally identifies a particular member of an entity. An example might be a customer number because only one person can have that number, but it contains no information about the customer themselves.
3. A **candidate key** is any field that can serve as a primary key. In the previous example, you might have the option to use a customer number, social security number, or telephone number as the primary key. You always choose the field that contains the least amount of data and is easiest to use as the primary key.
4. A **secondary key** is a field or combination of fields that can be used to retrieve or access records. They are not unique. An example would be using a zip code to look up records.
5. A **foreign key** is a field in one table that must match a primary key value in another table in order to establish the relationship between the two tables. It doesn’t have to be unique.
6. A **common field** is an attribute that appears in more than one entity. They can be used to link entities in various types of relationships.
7. **What are entity-relationship diagrams and how are they used? What symbol is used to represent an entity in an ERD? What symbol is used for a relationship? What is cardinality, and what symbols do you use in the crow’s foot notation method?**
8. An entity-relationship diagram is a model that shows the logical relationships and interaction among system entities.
9. An ERD provides an overall view of the system and a blueprint for creating the physical data structures.
10. Entities are represented by a rectangle in an ERD.
11. Relationships are represented by a diamond shape in an ERD.
12. Cardinality describes the numeric relationship between two entities and shows how instances of one entity relates to instances of another. In crow’s foot notation, you use a single bar to indicate one, a double bar to indicate one and only one, a circle to indicate zero and a crow’s foot to indicate many.
13. **What are data warehousing and data mining? Are the terms related?**
14. A **data warehouse** is an integrated collection of data that can include seemingly unrelated information, no matter where it is stored in the company. A data warehouse can link various information systems and databases, which provides an enterprise-wide view to support management analysis and decision making.
15. **Data mining** software looks for meaningful data patterns and relationships. For example, data mining software could help a company identify potential customers based on prior purchases.
16. Data warehousing and data mining are related. Data mining software searches databases for patterns in a customer’s shopping. The company mining the information then uses this data to present similar choices to the consumer for purchase. The data warehouse is where the data is stored, thus where the data is being mined from.

**Chapter 9a - Personal Trainer, INC**

1. **Review the Personal Trainer fact-finding summary in Chapter 4 and draw an ERD with cardinality notation. Assume that system entities include members, activities and services, and fitness instructors.**

* ERD with cardinality notation.

ASSIGNED TO

M

1

INSTRUCTOR

ACTIVITY

OR

SERVICE

MEMBER

1

1

CREATES

ENROLLS

M

M

TRAINING

RECORD

1. **Design tables in 3NF. As you create the database, include various codes for at least three of the fields.**
   * 3NF Tables.

MEMBER (MEMBER\_ID, LASTNAME, FIRSTNAME, ADDRESS, PHONE)

INSTRUCTOR (INSTRUCTOR\_ID, LASTNAME, FIRSTNAME, ADDRESS, PHONE)

ACTIVITY (ACTIVITY\_NO, COURSE\_NAME, DATE, HOURS, TUITION\_FEE)

TRAINING RECORD (MEMBER\_ID, ACTIVITY\_NO, DATE, FITNESS\_LEVEL)

**Chapter 9a - Case in Point 9.1: TOPTEXT PUBLISHING**

See attached ERD with Cardinality Notation