CHAPTER 6 SUMMARY

Objective 1: Identify Good Database Design

A ***database*** is an organized collection of data—facts about people, events, things, or ideas—related to a specific topic or purpose. ***Information*** is data that is organized in a useful manner.

A simple database is called a ***flat database*** because it is not related or linked to any other collection of data. An example of a simple database is a list of movie DVDs.

A more sophisticated type of database is a ***relational database***, because multiple collections of data in the database are related to one another. Examples of a relational database are data about the students, courses, and faculty members at a college.

Access 2010 is a relational ***database management system***—also referred to as a ***DBMS***—which is software that controls how related collections of data are stored, organized, retrieved, and secured.

Tables are the foundation of an Access database because all of the data is stored in one or more tables. A table is similar in structure to an Excel worksheet; that is, data is organized into rows and columns.

- Each table row is a ***record***—all of the categories of data pertaining to one person, place, thing, event, or idea.
- Each table column is a ***field***—a single piece of information for every record.

Principles of good database design:

- The ***first principle of good database design*** is to organize data in the tables so that ***redundant***—duplicate—data does not occur.
- The ***second principle of good database design*** is to use techniques that ensure the accuracy of data when it is entered into the table

Normalization is the process of applying design rules and principles to ensure that a database performs as expected. Taking the time to plan and create a database that is well designed will ensure that meaningful information can be retrieved from the database.

The tables of information in a relational database are linked, or joined, to one another by a ***common field***—a field in one or more tables that stores the same data.

Objective 2: Create a Table and Define Fields in a New Database

The two methods to create a new Access database are:

- Create a new database using a ***database template***—a preformatted database designed for a specific purpose.
- Create a new database from a ***blank database***. A blank database has no data and has no database tools.

Refer to Figures 13.5 and 13.6 for the parts of the Access Database Window.

When a table is displayed in ***Datasheet View***, the data is displayed in columns and rows similar to the format of an Excel worksheet.

When a table is displayed in ***Design View***, the underlying design—the ***structure***—of the table's fields is displayed.

The ***object window*** displays the open object.

The ***Navigation Pane*** is an area of the Access window that displays and organizes the objects in a database, and it is the area from which objects are opened for use.

Data type is the characteristic that defines the kind of data that can be typed in a field, such as numbers, text, or dates.

The ***Caption*** property is used to display a name for a field other than that listed as the field name.

The ***AutoNumber data type*** describes a unique sequential or random number assigned by Access as each record is entered.

Objective 3: Change the Structure of Tables and Add a Second Table

A table can be created or modified in Datasheet View. To define and modify fields, many database experts prefer to work in Design View, where you have additional options for defining the fields in a table.

When entering data, there are two ways to help reduce errors—to restrict what can be typed in a field and to add descriptive information.

Field properties control how the field displays and how data can be entered in the field. However, this does not prevent someone from entering incorrect data.

Although a printed table does not look as professional as a printed report, there are times when a basic table is printed.

Objective 4: Create and Use a Query, Form, and Report

A ***query*** is a database object that retrieves specific data from one or more database objects—either tables or other queries—and then, in a single datasheet, displays only the specified data.

A ***form*** is an Access object with which you can enter edit, or display data from a table or a query.

A ***report*** is a database object that displays the fields and records from a table or a query in an easy-to-read format suitable for printing.

A ***select query***, also called a ***simple select query***, retrieves (selects) data from one or more tables or queries and then displays the selected data in a datasheet.

Objective 5: Save and Close a Database

When an Access table is closed, any changes made to the records are saved automatically.

However, if the design of the table is changed or the layout of the table is changed, then a prompt is displayed asking to save the design changes.

Objective 6: Open an Existing Database

The ***Message Bar*** is the area below the Ribbon that displays information, such as security alerts, when there is potentially unsafe, active content in an Office document that you open.

Settings that determine the alerts that display on the Message Bar are set in the Access ***Trust Center***, which is an area of Access where the security and privacy settings for Access can be viewed.

Objective 7: Create Table Relationships

Access databases are relational databases because the tables in the database can relate to other tables through common fields.

A ***relationship*** is an association that is established between two tables based on common fields.

The most common type of relationship in Access is a ***one-to-many relationship***.

A ***foreign key*** is the field in the related table used to connect to the primary key in another table.

Referential integrity is a set of rules that Access uses to ensure that the data between related tables is valid.

Objective 8: Sort Records in a Table

Sorting is the process of arranging data in a specific order based on the value in a field. Data can be sorted in either ***ascending order*** or ***descending order***.

When sorting a table on two or more fields, first identify the fields that will act as the ***outermost sort field*** and the ***innermost sort field***. The outermost sort field is the first level of sorting, and the innermost sort field is the second level of sorting.

Objective 9: Create a Query in Design View

A query is useful because it creates a ***subset*** of records—a portion of the total records—according to the specifications and then displays only those records.

The Query window has two parts: the ***table area*** (upper area), which displays the field lists for tables that are used in the query, and the ***design grid*** (lower area), which displays the design of the query.

Objective 10: Create a New Query from an Existing Query

A new query can be created from scratch or an existing query can be opened.

Objective 11: Sort Query Results

You can sort the results of a query in ascending or descending order in either Datasheet View or Design View. Use Design View if your query results should display in a specified sort order, or if you intend to use the sorted results in a report.

Objective 12: Specify Criteria in a Query

Queries locate information in a database based on ***criteria*** that are specified as part of the query. Criteria are the conditions that identify the specific records that are being sought.

When creating a query using textual data, Access places quotation marks around the criteria to indicate that this is a ***text string***—a sequence of characters.

Records that are empty can be located by using ***Is Null***—empty—as the criteria in a field.

Additionally, records can be displayed where a value has been entered in a field by using ***Is Not Null*** as the criteria, which will exclude records where the specified field is empty.

Objective 13: Specify Numeric Criteria in a Query

Criteria can be set for fields containing numeric data. When designing a table, the appropriate data type for fields that will contain numbers, currency, or dates should be set so that mathematical calculations can be performed.

When creating a relationship between two tables, Enforce Referential Integrity should be checked. When a one-to-many relationship is established, the 1 and the infinity symbol (∞) indicate that referential integrity is enforced.

Comparison operators are symbols—same (=), greater than (>), or less than (<) —that are used to evaluate each field value to determine its relationship to the specified criteria.

The ***Between … And operator*** is a comparison operator that looks for values within a range and is useful when locating records that are within a range of dates.

Objective 14: Use Compound Criteria

When more than one condition—criteria—is specified in a query, it is called ***compound criteria***.

Compound criteria use AND and OR ***logical operators***. Logical operators enable the entry of criteria for the same field or different fields.

Objective 15: Create a Query Based on More Than One Table

In a relational database, information can be retrieved from more than one table. Tables are joined by relating the primary key field in one table to a foreign key field in another table.

Objective 16: Use Wildcards in a Query

Wildcard characters serve as a placeholder for one or more unknown characters in query criteria.

Objective 17: Use Calculated Fields in a Query

Queries can create calculated values that are stored in a ***calculated field***. A calculated field stores the value of a mathematical operation.

A ***Property Sheet*** is a list of characteristics—properties—for a field to which you can make precise changes to each property associated with the field.

Objective 18: Calculate Statistics and Group Data in a Query

In Access queries, statistical calculations can be performed on a group of records. Calculations that are performed on a group of records are called ***aggregate functions***.

Refer to Figure 13.77 for the complete list of aggregate functions.

Objective 19: Create a Crosstab Query

A ***crosstab query*** uses an aggregate function for data that can be grouped by two types of information and displays data in a compact, spreadsheet-like format.

Crosstab queries are used to summarize a large amount of data in a small space that is easy to read.