Microsoft Office 2007 (Brief Concepts and Techniques)
Windows XP Edition

I. Creating and Using a Database
   a. Objectives
      i. Describe databases and database management systems
      ii. Design a database to satisfy a collection or requirements
      iii. Start Access
      iv. Describe the features of the Access Window
      v. Create a table and add records
      vi. Close a table
      vii. Close a database and quit Access
      viii. Open a database
      ix. Print the contents of a table
      x. Create and print custom reports
      xi. Create and use a split form
      xii. Use the Access Help system

II. What Is Microsoft Office Access 2007?
    Microsoft Office Access 2007, usually referred to as simply Access, is a database management
    system. A database management system such as Access, is a software tool that allows you to use a
    computer to create a database; add, change, and delete data in a database; sort the data in the database;
    retrieve data in the database; and create forms and reports using the data in the database. The term
    database describes a collection of data organized in a manner that allows access, retrieval, and use of
    that data. Some of the key features in Access are:

    - **Data entry and update** – Access provides easy mechanisms for adding, changing, and
      deleting data, including the capability of making mass changes in a single operation.
    - **Queries (questions)** – Access makes it possible to ask complex questions concerning the data
      in the database and then receive instant answers.
    - **Forms** – Access allows the user to produce attractive and useful forms for viewing and
      updating data.
    - **Reports** – Access includes report creation tools that make it easy to produce sophisticated
      reports for presenting data.
    - **Web support** – Access allows you to save objects, reports, and tables in HTML format so they
      can be viewed using a browser.

    This latest version of Access has many new features to help you to be more productive. Like the other
    Office applications, it features a new, improved interface utilizing the Ribbon. The new Navigation
    pane makes navigating among the various objects in a database easier and more intuitive than in the
    past. The new version includes several professionally designed templates that you can use to quickly
    create a database. Sorting and filtering has been enhanced in this version.

    Program Planning Guide. The process of developing a database that communicates specific
    information requires careful analysis and planning. As a starting point, establish why the database is
    needed. Once the purpose is determined, analyze the intended users of the database and their unique
    needs. Then, gather information about the topic and decide what to include in the database. Finally,
    determine the database design and style that will be most successful at delivering the message.

    In Access, a database consists of a collection of tables, each of which contains information on a specific
    subject. The tables below contain information about the clients to whom JSP provides services and
    information about the recruiters to whom these clients are assigned.
The rows in the tables are called **records**. A record contains information about a given person, product, or event. A row in the Client table, which is displayed above, contains information about a specific client.

The columns in the tables are called **fields**. A **field** contains a specific piece of information within a record. In the Client table, displayed above, the fourth field, City, contains the city where the client is located.

The first field in the Client table is the Client Number. A number is assigned to each client. As is common to the way in which many organizations format client numbers, in this database it is called a number, although it actually contains letters. The client numbers consist of two uppercase letters followed by a two-digit number.

These numbers are unique; that is, no two clients are assigned the same number. Such a field can be used as a **unique identifier**. This simply means that a given client number will appear only in a single record in the table. Only one record exists, or example, in which the client number is BH72. A unique identifier also is called a **primary key**. Thus, the Client Number field is the primary key for the Client table.

**Database Design Guidelines**

Database design refers to the arrangement of data into tables and fields. On your first Access assignment, the design was specified, but in many cases, you will have to determine the design based on what you want the system to accomplish.

When designing a database, the actions you take and the decision you make will determine the tables and fields that will be included in the database. As you create a database, such as the one done in Assignment #6, you should follow these general guidelines:

1. **Identify the tables.** Examine the requirements for the database in order to identify the main objects that are involved. There will be a table or each object you identify.

   In one database, for example, the main objects might be departments and employees. Thus, there would be two tables: one for departments and the other for employees. In another database, the main objects might be clients and recruiters. In this case, there would also be two tables: one for clients and the other for recruiters.

2. **Determine the primary keys.** Recall that the primary key is the unique identifier for records in the table, for example, the unique identifier might be the Department Code. For a Book table, the unique identifier might be the ISBN number.
3. **Determine the additional fields.** The primary key will be a field or combination of fields in a table. There typically will be many additional fields, each of which contains a type of data. Examine the project requirements to determine these additional fields. For example, in an Employee table, the additional fields might include such fields as Employee Name, Street Address, City, State, Postal Code, Date Hired, Salary, and so on.

4. **Determine relationships among the tables.** Examine the list of tables you have created to see which tables are related. When you determine two tables are related, include matching fields in the two tables. For example, in a database containing employees and departments, there is a relationship between the two tables because one department can have many employees assigned to it. The Department Code could be the matching field in the two tables.

5. **Determine data types and field sizes for the fields.** For each field, determine the type of data the field can contain. One field, for example, might contain only numbers. Another field might contain currency amounts, while a third field might contain only dates. Some fields contain text data, meaning any combination of letters, numbers and special characters (!, ;, ‗, & and so on). For example, in an Employee table, the Date Hired field would contain dates, the Salary field would contain currency amounts, and the Hours Worked field would contain numbers. The other fields in the Employee table could contain text data, such as Employee Name and Department Code.

Determining the field size for various data types is another important step in designing the database. The field size of a field is simply number of characters contained in the information to be entered into the field. In the size of a field, when appropriate, find out the size of the largest data entry, and for flexibility, increase the size by a few characters. **NOTE:** If a field is create with a field size of four (4), this means that this field will only accept four characters. If the field size needs to be increased, you must return to the Design View of the table and increase the field size of that field.

6. **Identify and remove any unwanted redundancy.** **Redundancy** is the storing of a piece of data in more than one place. Redundancy usually, but not always, causes problems, such as wasted space, difficulties with update, and possible data inconsistency. Examine each table you have created to see if it contains redundancy and, if so, determine whether the redundancy causes these problems. If it does, remove the redundancy by splitting the table into two tables. For example, you may have a single table of employees. In addition to typical employee data (name, address, earnings, and so), the table might contain Department Number and Department Name. If so, the Department Name could repeat multiple times.

Every employee whose department number is 12, for example, would have the same department name. It would be better to split the table into two tables, one for Employees and one for Department. In the Department table, the Department Name is stored only once.

7. **Determine a location for the database.** The database you have designed will be stored in a single file. You need to determine a location in which to store the file.

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**III. Database Requirements**

**a. Naming Tables and Fields**

In designing your database, you must name the tables and fields. Thus, before beginning the design process, you must understand the rules for table and field names, which are:

1. Names can be up to 64 characters in length.
2. Names can contain letters, digits, and spaces, as well as most of the punctuation symbols.
3. Name cannot contain periods (.) exclamation points (!), accent graves (‘), or square brackets ([]).
4. The same name cannot be used for two different fields in the same table.
The approach to naming tables and fields used in this text is to begin the names with an uppercase letter and to use lowercase for the other letters. In multiple-word names, each word begins with an uppercase letter, and there is a space between words (for example, Client Number). Still others use an underscore in place of the space, (for example, Client_Number). Finally, some use an underscore in space of a space, but use the same case for all letters (CLIENT_NUMBER or client_number).

b. Identifying the Tables
Once you know the rules for naming the tables and fields, you can begin the design process. The first step is to identify the main objects involved in the requirements. For the JSP Recruiters database, the main objects are clients and recruiters. This leads to two tables, which you must name. Reasonable names for these two tables are Client and Recruiter.

c. Determining the Primary Key
The next step is to identify the fields that will be the primary keys. Client number uniquely identifies clients, and recruiter numbers uniquely identify recruiters. Thus, the primary key for the Client table is the client number, and the primary key for the Recruiter table is the recruiter number. Reasonable names for these fields could be Client Number and Recruiter Number, respectively. Adding these primary keys to the table gives:

<table>
<thead>
<tr>
<th>Client</th>
<th>(Client Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruiter</td>
<td>(Recruiter Number)</td>
</tr>
</tbody>
</table>

d. Determining Additional Fields

```
<table>
<thead>
<tr>
<th>Client Number</th>
<th>Client Name</th>
<th>Street</th>
<th>City</th>
<th>State</th>
<th>Postal Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC34</td>
<td>Alys Clinic</td>
<td>134 Central</td>
<td>Berridge</td>
<td>CO</td>
<td>80330</td>
</tr>
<tr>
<td>BH72</td>
<td>Bells Hospital</td>
<td>415 Main</td>
<td>Berrys</td>
<td>CO</td>
<td>80349</td>
</tr>
<tr>
<td>BL12</td>
<td>Benton Labs</td>
<td>12 Mountain</td>
<td>Denton</td>
<td>CO</td>
<td>80412</td>
</tr>
<tr>
<td>EA45</td>
<td>ENT Assoc</td>
<td>867 Ridge</td>
<td>Fort Stewart</td>
<td>CO</td>
<td>80336</td>
</tr>
<tr>
<td>FO89</td>
<td>Forb Dentistry</td>
<td>34 Cressview</td>
<td>Berridge</td>
<td>CO</td>
<td>80330</td>
</tr>
<tr>
<td>FH22</td>
<td>Family Health</td>
<td>123 Second</td>
<td>Tarleton</td>
<td>CO</td>
<td>80409</td>
</tr>
<tr>
<td>MH56</td>
<td>Maun Hospital</td>
<td>76 Dixon</td>
<td>Mason</td>
<td>CO</td>
<td>80356</td>
</tr>
<tr>
<td>PR11</td>
<td>Peel Radiology</td>
<td>151 Valleyview</td>
<td>Fort Stewart</td>
<td>CO</td>
<td>80336</td>
</tr>
<tr>
<td>TC37</td>
<td>Tarleton Clinic</td>
<td>451 Hull</td>
<td>Tarleton</td>
<td>CO</td>
<td>80409</td>
</tr>
<tr>
<td>WL56</td>
<td>West Labs</td>
<td>785 Main</td>
<td>Berrys</td>
<td>CO</td>
<td>80349</td>
</tr>
</tbody>
</table>
```

After identifying the primary keys, you need to determine and name the additional fields. In addition to the client number, the Client Address Information contains the client name, street, city, state, and portal code. These would be fields in the Client table. The Client Financial Information contains the client number and the client name, which is already included in the Client table. The financial information also contains the amount paid and the current due. Adding the amount paid and current due fields to those already identified in the Client table and assigning reasonable names gives:

```
Client (Client Number, Client Name, Street, City, State, Postal Code, Amount Paid, Currency Due)
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Similarly, examining the Recruiter Address Information adds the last name, first name, street, city, state, and postal code fields to the Recruiter table. In addition to the recruiter number, last name, and first name, the Recruiter Financial Information table and assigning reasonable names gives:

Recruiter (Recruiter Number, Last Name, First Name, Street, City, State, Postal Code, Rate, Commission)

Determining and Implementing Relationships Between the Tables
The most common type of relationship you will encounter between tables is the **one-to many relationship**. This means that each row in the first table may be associated to many rows in the second table, but each row in the second table is associated with only one row in the first. The first table is called the “one” table and the second is called the “many” table. For example, there may be a relationship between departments and employees, in which each department can have many employees, but each employee is assigned to only one department. In this relationship, there would be two tables, Department and Employee. The department table would be the “one” table in the relationship. The Employee table would be the “many” table.

To determine relationships among tables, you can follow these general guidelines:
1. Identify the “one” table.
2. Identify the “many” table.
3. Identify the primary key from the “one” table as a field in the “many” table.

According to the requirements, each client has one recruiter, but each recruiter can have many clients. Thus, the Recruiter table is the “one” table. To implement this one-to-many relationship between recruiter and clients, add the Recruiter Number field (the primary key of the Recruiter table) to the Client table. This produces:

Client (Client_Number, Client_Name, Street, City, State, Postal_Code, Amount_Paid, Current_Date, Recruiter_Number)

Recruiter (Recruiter_Number, Last_Name, First_Name, Street, City, State, Postal_Code, Rate, Commission)

Determining Data Types for the Fields
Each field has a **data type**. This indicates the type of data that can be stored in the field. The three most commonly used data types are:

1. **Text** – The field can contain any characters. The maximum number of 255 characters is allowed in a field whose data type is Text.
2. **Number** – The field can contain only numbers. The numbers either can be positive or negative. Fields are assigned this type so they can be used in arithmetic operations.
operations. Fields that contain numbers but will not be used for arithmetic operations usually are assigned a data type of Text.

3. **Currency** – The field can contain only monetary data. The values will appear with currency symbols, such as dollar signs, commas, and decimal points, and with two digits following the decimal point. Like numeric fields, you can use currency fields in arithmetic operations. Access assigns a size to currency fields automatically.

**Other fields include:**

4. **Memo** – This field can store a variable amount of text or combinations of text and numbers where the total number of characters may exceed 255.

5. **Date/Time** – Stores Date and time values for the years 100 through 9999.

6. **AutoNumber** - Stores unique sequential (incremented by 1) number or random number assigned by Microsoft Access whenever a new record is added to a table. AutoNumber fields can't be updated.

7. **Yes/No** – Stores one of two values; Yes and No values and fields that contain only one of two values (Yes/No, True/False, or On/Off).

8. **OLE Object** – stores an object (such as a Microsoft Excel spreadsheet, a Microsoft Word document, graphics, sounds, or other binary data) linked to or embedded in a Microsoft Access table.

*Up to 1 gigabyte (limited by available disk space)*

9. **Hyperlink** - Text or combinations of text and numbers stored as text and used as a hyperlink address. A hyperlink address can have up to three parts:
   a. text to display — the text that appears in a field or control.
   b. address — the path to a file (UNC path) or page (URL).
   c. subaddress — a location within the file or page.
   d. screentip — the text displayed as a tooltip.

   Each part of the three parts of a **Hyperlink** data type can contain up to 2048 characters

10. **Attachment** - Any supported type of file. You can attach images, spreadsheet files, documents, charts, and other types of supported files to the records in your database, much like you attach files to e-mail messages. You can also view and edit attached files, depending on how the database designer sets up the Attachment field. Attachment fields provide greater flexibility than OLE Object fields, and they use storage space more efficiently because they don't create a bitmap image of the original file.

11. **Lookup Wizard** - Creates a field that allows you to choose a value from another table or from a list of values by using a list box or combo box. Clicking this option starts the Lookup Wizard, which creates a Lookup field. After you complete the wizard, Microsoft Access sets the data type based on the values selected in the wizard.
The following steps, which assume Windows is running, start Access bases on a typical installation. If a custom installation was done, you may need to ask the owner of the computer how to start Access.

1. Click the Start Button on the Windows taskbar to display the Start menu.
2. Point to All Programs on the Start menu to display the All Programs submenu.
3. Point to Microsoft Office on the All Programs submenu to display the Microsoft Office submenu.
4. Click the Microsoft Access 2007 to start Access and display the Getting Started with Microsoft Office Access screen.
V. Creating a Database
In Access, all the tables, reports, forms and queries that you create are stored in a single file called a database. Thus, before creating any of these objects, you first must create the database that will hold them. You can use either the Blank Database option or the template to create a new database. If you already know the table and fields you want in your database, you would use the Blank Database option. If not, you can use a template. Templates can guide you by suggesting some commonly used databases.

Determine where to create the database. When creating a database, you must decide which storage medium to use.

If you always work on the same computer and have no need to transport your database to a different location, then your computer's hard drive will suffice as a storage location. It is a good idea, however to save a backup copy of your database on a separate medium in case the file becomes corrupt, or the computer's hard drive fails.

If you plan to work on your database in various locations or on multiple computers, then you can consider saving your projects on a portable medium, such as a USB flash drive or CD. The

VI. The Access Window

Quiz 9
The Access window consists of a variety of components to make your work more efficient and documents more professional. These include the Navigation pan, Access work area, Ribbon, Mini toolbar and shortcut menus, Quick Access Toolbar, and Office Button. Some of these components are common to other Microsoft Office 2007 programs; others are unique to Access.

The Access work area contains an insertion point, mouse pointer, scroll bar, and status bar. The **insertion point** is a blinking vertical bar that indicates where text, graphics, and other items will be inserted. As you type, the insertion point moves to the right. The **mouse pointer** becomes different shapes depending on the task you are performing in Access and the pointer's location on the screen.

You use the **scroll bar** to display different portions of the database object in the Access window. At the right edge of the window is a **vertical scroll bar**. If the object is too wide to fit in the Access window, a **horizontal scroll bar** also appears at the bottom of the window. On the scroll bar, the position of the **scroll box** reflects the location of the portion of the database object that is displayed in the Access window. A **scroll arrow** is located at each end of a scroll bar. To scroll through, or display different portions of the object in the Access window, you can click a scroll arrow or drag the scroll box.

The **status bar**, located at the bottom of the Access window above the Windows taskbar presents information about the database object, the progress of current tasks, and the status of certain commands and keys; it also provides controls for viewing the object. The **Ribbon** located near the top of the Access window, is the control center in Access. The Ribbon provides easy, central access to the tasks you perform while creating a database object. The Home tab, called the primary tab, contains the more frequently used commands. To display a different tab on the Ribbon, click the top-level tab. The tab currently displayed is called the active tab.

An **Enhanced Screen Tip** is an on-screen note that provides the name of the command, available keyboard shortcut(s), a description of the command and sometimes instructions for how to obtain help about the command. The lower-right corner of some groups of the Ribbon has a small arrow, called a **Dialog Box Launcher**, which, when clicked, displays a dialog box or a task pane with additional option for the group. The Mini toolbar, which appears automatically based on tasks you perform, contains commands related to changing the appearance of text in a database object. A **shortcut menu**, which appears when you right-click an object, is a list of frequently used commands that relate to the right-clicked object.

While the Ribbon is a control center for creating database objects, the **Office Button** is a central location for managing and sharing database objects. When you click the Office Button, located in the upper-left corner of the window, Access displays the Office Button menu. A **menu** is a list of commands. A **submenu** is a list of additional commands associated with the selected command.

**VII. Creating a Table**

When you first create your database, Access automatically creates a table for you. You can immediately begin defining a field. If, for whatever reason, you do not have this tab or inadvertently delete it, you can create the table by clicking Create n the Ribbon and then clicking the Table button on the Create tab. In either case, you are ready to define the fields.

Once the table is created, the next step is to define the fields in the table and assign them data types. When creating a table, check the entries carefully to ensure they are correct. If you discover a mistake while still typing the entry, you can correct the error by repeatedly pressing the BACKSPACE key until the incorrect characters are removed. Then, type the correct characters. If you do not discover a mistake until later, you can use the following techniques to make the necessary changes to the structure:

- To undo your most recent change, click the Undo button on the Quick Access Toolbar. If there is nothing that Access can undo, this button will be dim, and clicking it will have no effect.
- To delete a field right-click the column heading for the field (the position containing the field name), and then click Delete column on the shortcut menu.
- To change the name of a field, right-click the column heading for the field, click Rename Column on the shortcut menu, and then type the desired field name.
• To insert a field as the last field, right-click the Add new Field column heading, click Rename Column on the shortcut menu, type the desired field name, click the down arrow, and then ensure the correct data type is already selected.

• To insert a field between existing fields, right-click the column heading for the field that will follow the new field, and then click the column heading for the field that will follow the new field, and then click Insert Column on the shortcut menu. You then proceed just as you do when you insert a field as the last field.

As an alternative to these steps, you may want to start over. To do so, Click the Close button for the window containing the table, and then click the No button in the Microsoft Office Access dialog box. Click Create on the Ribbon and then click the Table button to create a table. You then can repeat the process you used earlier to define the fields in the table.

a. Add Records to a Table

Creating a table by building the structure and saving the table is the first step in a two-step process. The second step is to add records to the table. To add records to a table, the table must be open. When making changes to tables, you work in Datasheet view. In Datasheet view, the table is represented as a collection of rows and columns called a database. Records are normally added in phases. You may, for example, not have enough time to add all the records in one session.

VIII. Making Changes to the Data

Check your entries (data) carefully to ensure they are correct. If you make a mistake and discover it before you press the TAB key, correct it by pressing the BACKSPACE key until the incorrect characters are removed and then typing the correct characters. If you do not discover a mistake until later, you can use the following techniques to make the necessary corrections to the data:

• To undo your most recent change, click the Undo button on the Quick Access Toolbar. If there is nothing that Access can undo, this button will be dim, and clicking it will have no effect.

• To add a record, click the New (blank) record button, on the previous page, and then add the record. Do not worry about it being in the correct position in the table. Access will reposition the record based on the primary key.

• To delete a record, click the Record selector for the record to be deleted. Then press the DELETE key to delete the record, and click the Yes button when Access asks you to verify that you indeed wish to delete the record.

• To change the contents of one or more field in a record, the record must be on the screen. If it is not, use any appropriate technique, such as the UP ARROW and DOWN ARROW keys or the vertical scroll bar, to move to it.

IX. AutoCorrect

Not visible in the Access window, the AutoCorrect feature of Access works behind the scenes, correcting common mistakes when you complete a text entry in a cell. AutoCorrect makes three types of corrections for you:

• Corrects two initial capital letters by changing the second letter to lowercase
• Capitalize the first letter in the names of days.
• Replaces commonly misspelled words with their correct spelling. For example, it changes the misspelled word receive to receive when you complete the entry
Quiz 10

- Add notes for Quitting Access
- Add printing in Report