

## **1. What is Database?**

When a collection of data is small and simple, you can keep track of the entire information with simple lists. However, as the volume of information grows, you need a more efficient way of storing, processing and retrieving data. If you want to maintain the information and be able to access it at snap of your finger, **Microsoft Access data base management system** is the product of use.

A database is a systematic organization of data for easy retrieval. Employee records in the file cabinet, a stamp collection in an album, and a collection of sales in a notebook are collections of data called **database**. A database may be created and maintained manually or it may be computerized. A computer database is created and maintained by a **database management system (DBMS)**

A database management system is software, which is used to create, store, modify and access data in a database. A database management system serves like a bridge between the user and application programs.

## **2. Components of DBMS**

The components of DBMS may vary, but the most common are: data dictionary, data language, Security software, archiving software, and query languages.

**Data dictionary:** contains the names and descriptions of all data elements in the database.

**Data languages:** are languages used to enter data element's name and description in a dictionary, and manipulate the database. The language that is used to define the data is called data definition language (DDL), and the language used by programmers to Manipulate data from a database is known as a data base manipulation language (DML).

**Security software:** is a collection of programs, which protect a database from unauthorized access.

**Archiving programs:** are programs used to create copies of the programs and database in case of emergency.

**Query language:** are set of commands that are used to create, update and retrieve data from a database. One of the most popular standard query language is **SQL** (Structured Query Language).

### 3. Types of DBMS

Based on the internal structure of data and their relationships, DBMS types are divided in to:

1. Hierarchal Model.
2. Network Model.
3. Relational Model.
4. Object oriented model.
5. Deductive or Interface Model.

But the main topic of discussion in this course is relational model.

### 4. Relational DBMS

The relational model is the most popular type of DBMS which organizes data in terms of tables, each data having their own fields and relate them through a key field are called **Relational Database Management System (RDBMS)**.

Microsoft Access is one of such RDBMS that provides standard database management features for data storage and retrieval.

## **5. What is Microsoft Access?**

Microsoft Access is a relational database management system, which allows the collection, organization, relational analysis, and presentation of information. Like most RDBMS, Microsoft Access enables you to create and manipulate database but with easy of use and being more powerful.

Applications that can be developed using Microsoft Access includes the following among others:

- ◆ Sales order processing.
- ◆ Inventory management.
- ◆ Library system.
- ◆ General Ledger.
- ◆ Account payable/receivable.
- ◆ Bill scheduling.
- ◆ Data analysis.

## **6. Access Database**

An Access Database (i.e. a database created by Access) is a collection of one or more files (called database objects) treated as a whole. MS-Access database objects are: tables, forms, queries, reports, macros and modules.

**Tables:** A table is a fundamental building block of an access database. All databases must have at least one table, because this is where the data is stored. Tables are grids of rows and columns. Each column in a table is called a **field**. Each field contains a specific type of information such as first name, last name, phone number, etc.

**Queries:** a query is a filter through which data is evaluated. You can define a filter criterion in a query and only those records, which meet this criterion, are displayed.

**Forms:** are used to simplify data entry work or to display information in a specific manner (or form) like columnar, tabular, data sheet, main/sub form, chart or pivot table form. Forms let you add, modify, and delete database data.

**Reports:** A report summarizes data in a format suitable for publishing that is to view data on the screen or to print it on a printer or to publish it on the web.

Reports are used to present data in a meaningful and attractive manner and here you can combine data, charts, images, and even audio and video.

**Macros:** is used to automate repetitive tasks. Basically any operation that you do over and over again can be automated by creating a macro, so that a click of a button or by pressing a particular key, an entire sequence of commands can be executed.

**Modules:** For most of your simple repetitive tasks, you can create macros and simplify your work. However, if you want to develop a full-fledged software application (package), which automates a wide variety of complex tasks, you should create a visual basic for application (VBA) module. For larger and complex projects, VBA gives you considerable flexibility, control, power and maintenance that is just not possible by writing simple macros.

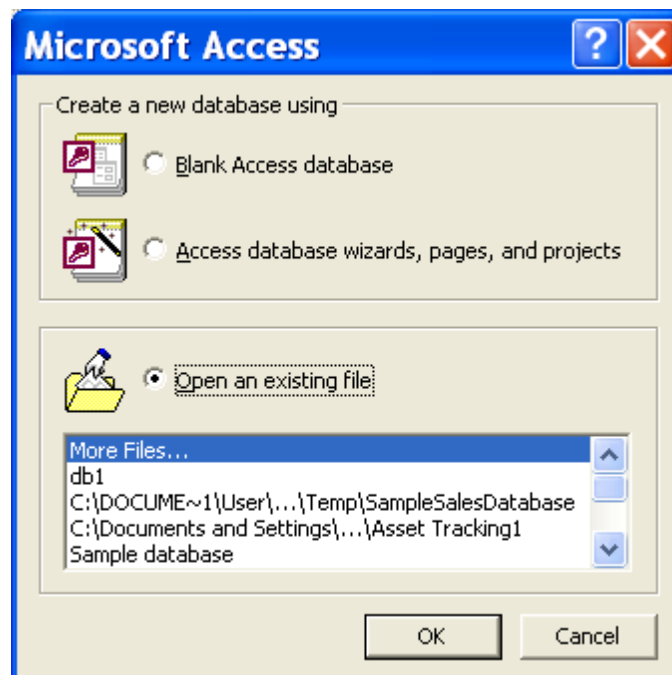
## **7. Starting MS-Access**

There may be several ways you can use to start MS-Access, depending on the configuration of your computer. But the most straight forward way to start MS-Access is:

1. Click the **Start** button.
2. Point to **All Programs**.
3. Click **MS-Access**.

## 8. Creating a New Database

When MS-Access starts, the first thing you see is a dialog box prompting you to create a new data base using Blank Access database, Access database wizards or open an existing one. When MS-Access starts, the following dialog box will be displayed automatically.



- ◆ Select the **Blank Access database** to create a new customized database.
- ◆ Select **Access database wizards, pages and projects** to create a new database with the help of wizard.
- ◆ Select **Open an existing file**, then click on the file you want from the list to open an existing database.

## 9. Creating a Database

Prior to using MS-Access to actually build the table, forms and other database objects that will create your database, it is important to take time to design your database. A good database design is a keystone to create a database that does what you want it to do effectively, accurately and efficiently. While planning for a database, keep the following points in mind.

- A. **Define the purpose of your database and how it is used.** Consider the present and future questions (queries) you may want to answer from the stored data. Example, if you want to run a query on the customer's database, to generate state wise and city wise lists, create two separate fields for city and state instead of one address field.
- B. **Determine the tables & the sizes and types of fields in each table.** Once you have a clear purpose for your database, and got some hint about the information that that should be stored, you can divide the information in to separate tables. Each table must contain information only about one subject like customers or items.
- C. **Determine the fields you need in each table:** To determine the fields in a table, decide what you need to know about people, things or events recorded in the table. For instance, information that is needed to be known about the customer is: their name, address (such as telephone, P. O. Box, city) and facts that needs to be known about transaction is: person who made the transaction, item number, unit price, quantity and data of transaction. When sketching out the fields for each table, keep these tips in mind.
  - ◆ Relate each field directly to the subject of the table.
  - ◆ Do not include derived or calculated data (data that is the result of the existing data.
  - ◆ Include all information you need.
  - ◆ Store information in its smallest logical parts (example, store first name and father name separately, rather than as full name together).

- D. **Determine fields, which uniquely identify the record in a table**, such a field is known as the **primary key** field. For example the ID number of two students in the same school cannot be the same. Therefore, the ID number field can serve as the primary key field in the student's table.
  
- E. **Determine the relationship between tables**. A relationship works by matching the data in two different tables using a common primary key field. There are three kinds of relationships: **One-to-One**, **One-to-Many** and **Many-to-Many**. In a **one to one** relationship, for one record in a table **A** there is only one corresponding record in table **B** .In **one-to-many** relationship, for each record in a table **A** there are many records in a table **B**. In many-to-many relationship, for each record in table **A**, there are many records in table **B** and for each record in table **B**, there are many records in table **A**.
  
- F. **Refine your database**. After you have designed the tables, fields and relationships you need, it is time to study the design and detect any flows that might remain. It is easier to change your data base design now, rather than you have filled the table with data.
  
- G. **Add data and create database objects**. When you are satisfied that the table structures meet the design goals described above, then it is the time to get a head and add all your existing data to the tables. You can then create any queries, forms, and reports that you may want.

MS-Access provides two methods to create a database:

- I. **Access database wizards**: to create in one operation the required tables, forms, and reports for the type of database you choose; this is the easiest way to start creating your database.

➤ To create a new database using Access database wizard:

1. If you started **Access**, and the **MS-Access** dialog box is still on screen, click **Access database wizard** radio button, and click **Ok**. Or if you have already closed the dialog box, select file, **New**.
2. Click **Database** tab, to display the list of wizards.
3. Click one of the Access database wizards you want to create. When you click on the wizard, a preview appears in the preview area.
4. When you find the wizard you want, click **Ok**. The **File, New** dialog box appears.
5. Type the name and the location for the database and click, **Create** to start defining your new database. The wizard starts and some information appears explaining what the wizard will do.
6. Click **Next** to continue. A list of tables to be created appears on the left, and the selected table's field appears on the right.
7. Click a table you want and examine its lists of fields. Optional fields are in italic and are deselected. To include an optional fields put the **check mark** in its check box.
8. Click **Next** to continue. The wizard asks you what kind of screen **display style** you want. Choose the one that you need.
9. Click a display style you want in the list and examine the preview of the style that appears. When you have decided on a style, click it and click **Next**. The wizard asks you for a style for printed reports.
10. Click **a report style** and examine the preview of it. When you have decided on a style, click it and click **Next**.
11. The wizard asks what title you want for the database. The title will appear on reports, and it can be different from the file name. Enter a title. If you need, you can include picture by checking **Yes, I I'd like include a picture** check box, and clicking **picture** button.
12. Click **Next** to continue.
13. When you get to the finish screen, click **Finish**.



The wizard starts creating the database. When the wizard is finished, the main switchboard window appears. The main switchboard lets you perform common tasks with the database by clicking a button the switchboard opens automatically whenever you open the database.

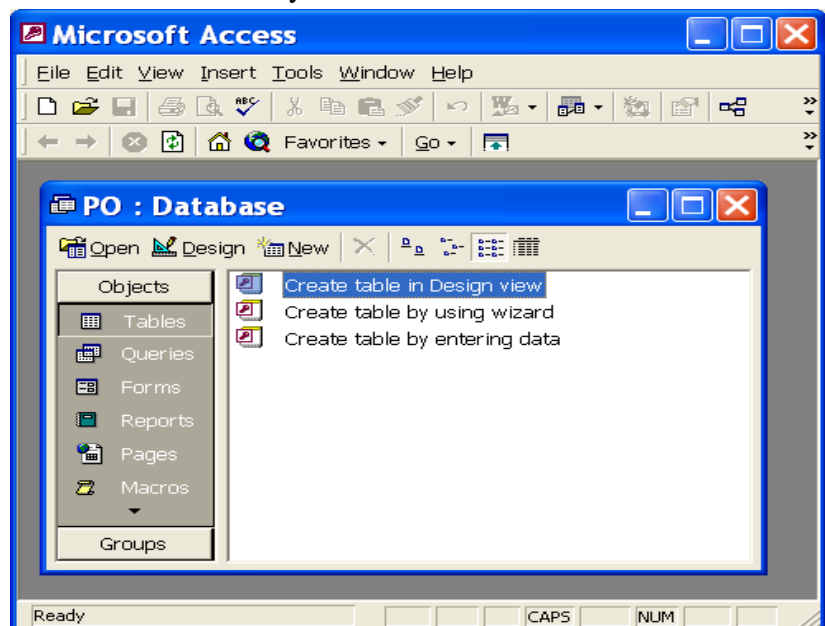
- To prevent the switchboard from opening whenever you open the database

1. Select the **Tool, Startup**.
2. Open the **Display from** drop down list and select (None).
3. Finally select Ok.

II. **Blank Access database:** you can create a blank Access database and then add the table, forms, reports, and other objects later. This is the most flexible method, but it requires you to define each data base element separately.

- To create a New database using a **Blank Access database:**

1. Start **MS-Access**.
2. Click **Blank Access database** radio button.
3. Click **Ok**.
4. Choose the folder or drive where you want to save your file in.
5. Give the name of database in the **File name** textbox.
6. Click **Create** button to create a new database. The following window would be displayed. This window is commonly known as **Main Switchboard**. It provides buttons to enable you to use the database easily.



## 9. Tables

The heart of each database is its tables. Access stores each database entry (such as each customer or each products item) in its own row, which is called a **record**. Each type of detail is kept in its own column, which is called a **field**. For example, Customers ID are one field, and Company Name is another. Each database files can have many tables like customers, employees, product, and sales, tables. All other database objects such as queries, forms, and reports depend on data stored in table (s). Hence, before creating other objects for your database, you must create tables.

### 9.1 Creating Tables

If there are other databases from which you can take some of the table, there is the **Import table** option. If not you will have to create a custom designed table, use the table wizard, or by entering data.

#### A. Creating a Table with the Table wizard

If the fields you want to create are similar to any of the access's dozens of pre-made ones, the table wizard can save you a lot of time and effort. Creating tables through the table wizard is much faster and easier than through design view and by entering data. However, if you use wizards, you are some what restricted with the pre-defined settings already available.

➤ To create a table using the table wizard:

1. Start **MS-Access**, if you are not in the Access program.
2. Select **Insert, Table** from the menu bar along the top of the screen. Or in the database window, click **Table** tab and click **New**. The new table dialog box appears.
3. Click **Table wizard** and click **Ok**.

4. Click a table in the **Sample Table** list. Access then displays its list in the sample field's list.
5. If you see the field that you want to include in your new table, select it in the **Sample Field** lists; then click > button to move it to the fields in **My new table** list. To move the entire content of the selected sample table to your list click >> button.
6. Repeat steps 4 and 5 to select other fields from other sample table until the list of the field in your new table is complete. You can remove a field or all the fields from the list by clicking < or >> button respectively. When you finish adding fields, click **Next** to continue.
7. The wizard asks for a name for the table. Type the more descriptive name to replace the default one.
8. Click **Yes, Set a primary key for me** to have the wizard choose your primary key field, or **No; I will set the primary key** to do it your self.  
If you choose **Yes**, skip to step 9. If you choose **No**, a dialog box appears asking which field will be the primary key. Open the drop- down list and select the field. Choose a data type for the primary field:
  - ◆ **Consecutive numbers MS-Access assign automatically to new records.** Choose this, if your primary key field is simple record number. That is, if you are numbering the record you enter consecutively as you enter them.
  - ◆ **Numbers I enter when I add new records.** Choose this, if you want to enter your own number. Access will not allow you to enter any letter.
  - ◆ **Number and /or letter I enter when I add new records. Choose this, if you want to include both number and letter in the field.**
9. Click **Next**.
10. At the **Finish** screen, click one of the following options:

1. **Modify the table design.** This takes you in to **Table Design View**, the same as if you had created all those fields your self. Choose this option if you have some change you want to make the table before you use it.
  2. **Enter data directly in the table.** This takes you to **Table Data sheet View**, where you can enter records into the row of the table. Choose this, if the table's design seems perfect to you as it is.
  3. **Enter data in to the table using a form the wizard creates for me.** It leads you right in to the form wizard.
11. Click **Finish**. Now it is the time to start entering the data into this table.
  12. Click on **Close** button to close the table you have created.
  13. Click on **Yes** button, to save the change you have made to your table.

### **B. Creating Table by Entering Data**

This method is used if you want to insert your field and data directly in to the task.

➤ To create a table by entering data:

1. Select **Insert, Table** or from the **database window**, click **Table** tabs and click **New**.
2. Click **Datasheet View to create table by entering data**, Click **Ok**.
3. Start entering data in to the table. As you see the columns are named as **Field1**, **Field2**, and so on. To make things simpler and easier to understand, rename the columns.

➤ To rename the columns:

1. Click on the column you want to rename.
2. Click **Rename column** from the **Format** menu, or double click on the column headings you want to rename.
3. Type the heading that you want when the cursor is placed on the column headings.

4. Save the database.
  - Choose **save** command from the **File** menu.
  - Give the name of the new table in this box.
  - Click **Ok**.
  - Since you have not defined the primary key, a dialog box comes that prompts you to do so.
  - Click **Yes**, to define a primary key.
  - You could still enter records into this database or close it now to close this database.

### **C. Creating a Table in Design View**

First you plan and create your database structure, identifying which all fields are required, which fields will contain what type of data (numeric, alphanumeric, data etc) and what will be the maximum width of each field. Once you have decided this structure, you can then create a table in the design mode (where you have to specify each and every thing your self).

- To create a table in **Table Design View**:
  - Select **Insert, Table** or, from the **database window**, click the table tab and click **New**.
  - Click on **Design view** and click **Ok**.
  - Or simply click on **Table** and double click on **Create table** on **Design view**. Here the table design view window is divided in to two parts. The upper part is divided into rows and three columns: **Fields Names**, **Data type**, and **Description**. Each row is used to write the name, to see data type, and to write some additional description of the field if necessary. The lower half is the field properties pane. Once you have named a field and set the data type, you can use the lower pane to set some additional field properties to determine the nature of the table.

- Type the field name in the **Filed Name** column, the press **Tab** Key to move the data type column.
- When you move to the **Data Type** column, a down ward arrow appears. Click it to see the drop-down list and select the data type.
- Press **Tab** key to move the **Description** (which is optional) column and type of a description of the field.
- In the **Field properties** pane, make any change as you need
- Repeat step 4 through 6 for other fields.
- Click **Close (X)** button.
- When you are asked to save the change, click **Yes** and type the name of the table on the **Table name** text box.
- Click **Ok**.

### **9.2 Understanding Data Types and Formats**

For each field to be included in a table you are expected to specify **Field name**, **Data type**, and **Description**, which is optional.

1. **Field Name:** is the name by which the field is identified. Microsoft Access field names can be up to 64 characters long and can include any combination of letters, numbers, spaces, and special characters except a period (.), exclamation mark (!), an accent grave (‘), and square brackets ([ ]). Also field names must not start with space.

2. **Data Type:** Each field must have a type so that **Access** will know how to handle its content. Here are the types you can choose from.

**Text:** plain ordinary typed text, which can include numbers, letters and symbols. A text field can contain up to 255 characters.

**Memo:** More plain ordinary text, except this, one does not have maximum field length. So you can type an almost infinite amount of text (64,000 characters).

**Number:** a plain ordinary number (not a currency or date value). Access will not allow any text in a number field.

**Date/Time:** to store date and time.

**Currency:** a number formatted as an amount of money.

**Auto Number:** a number that Access automatically fills in for each consecutive record.

**Yes/No:** the answer to true/false questions. It can contain either of two values, which might be **Yes** or **No**, **True** or **False**, **ON** or **OF**

**OLE Objects:** Enables you to store documents, spreadsheet, graphics, drawings, sound and other information created in MS-Window applications.

**Hyperlink:** A link to a location on the World Wide Web.

**Lookup Wizard:** Lets you create a list to choose a value from another table or list of value in a combo box for each record.

3. **Description:** is an optional descriptive text that you can add for a field you create. This description will appear down at the bottom of the Access start up window when the field is clicked A description can be used as a guide line for user, and its length can be up to 255 characters long including space.

### **9.3 Setting Field Properties**

In addition to a data type each field have formatting options you can set. They appear at the bottom half of the dialog box in the field properties area. Properties you can set for field are dependent on its data type.

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**Field size:** The maximum number of character a user can in put in that field.

**Format:** A drop-down list of the available formats for that field type. You can also create custom formats of your own.

**Decimal Places:** For number fields, you can set a default number of decimal places so a number will show.

**In put Mask:** Formatting character for data entry specially used when the data entered in the field has pre-defined masks or customize your own.

**Caption:** Field liable to be used in a form or report.

**Default Value:** If a field is usually going to contain a certain value, you can enter it here to save time. It will always appear in a new record and you can type over it in rear instance when it does not apply.

**Validation rule:** Are expression used by Access to determine whether or not an item entered in a field should be stored as a value.

**Validation Text:** That appears when invalid data is entered in to a field.

**Required:** Choose **Yes** or **No** o tell Access whether a user should be allowed to leave this field blank, when entering a new record.

**Allow Zero Length:** setting this defines whether zero length strings are permitted.

**Indexed:** When this property is to **Yes** for a field, Access creates and maintains an index of values entered in to the field so that it could be accessed faster than any no indexed field.

➤ To set the field property:

1. In the **Table Design Window**, select the field for which you want to set properties, Access displays the properties for this fields in **Field properties** panel.
2. Click the property you want to set at the **Field properties** panel.
3. Set the property. If an arrow appears to the right a **property box** when you select a property, you can click the arrow and select from the list. If **Build** button appears, you can click the button to have the builder help you set the property.
4. Repeat step 1-3 for each field you want to set property.
5. Finally click **Save** button on the **Tool bar**.



**Note:** It is always a good idea to limit a field size to the smallest setting you need, since MS-Access works faster with smallest field sizes.

## **9.4 Modifying a Table**

No matter how you create your table, you can modify it using **Table Design View**:

➤ To enter table design view:

1. From the **Database Window**, select the table you want to modify and click the **Design** button or,
2. If the table appears in the **Data sheet view**, select **View, Table Design**, or click **View** button from the standard tool bar.

➤ To Delete Fields:

1. In **Table Design** window click on the row selector (found at the left of the field name you want to delete) of the field.
2. Do one of the following:
  - a. Press the **Delete** key on the **keyboard**.
  - b. Click The **Delete Rows** button on the **Toolbar**.
  - c. Select **Edit, Delete Row**.

➤ To rearrange order of fields:

1. Click on the Row selector of the field name you want to move to another position. The Row selector shows a small triangle.
2. Click the Row selector again, and drag it to a new position.

### **9.5 Copying and Moving Database Objects**

1. In the database window, select the **Object**.
2. Open the **Edit** menu and select **Copy** (to copy) or **Cut** (to move) or click **Copy** or **Cut** button on the standard tool bar.
3. If you are coping or moving the object in to different database, close the current database and open the database into which you want to paste the object.
4. From the **Edit** Menu, choose **Paste**.

### **9.6 Setting the Primary key**

Microsoft Access works most efficiently if you specify a primary key. The primary key of a table consists of one or more fields that uniquely identify each record you store in the table. A primary key is often an ID number or code, since these types of value is always different from each record. You should always specify a primary key for the table. A table with a primary key has the following advantages.

- ♥ Microsoft Access creates an index for the primary key. This index helps speed up queries and other operations.
- ♥ When you view records in a form or data sheet, Microsoft Access displays them in primary key by default.
- ♥ When you add data to your table, Microsoft Access does not allow record with the same primary key value as another existing record. Because of this, you can be sure that each record is uniquely identified.

- To set the primary key:
  - a. Click the field that you want to use for the primary key. To create a multiple field primary key, hold down the **Ctrl** key and click the field selector to the left of each field that you want to include.
  - b. From the **Edit** menu, choose **Set Primary** key, or click the **Set primary key** button from the tool bar. Microsoft Access adds a key indicator to the left of the field or fields you specify as the primary key.
  
- To remove a primary key:
  - 1. Open the table in **Design view**.
  - 2. Click the row selector for the primary key.
  - 3. Click **Primary key** on the tool bar.
  - 4. Save the table.

**Note:** If the primary key is used in a relationship, you must delete the relationship before you remove the primary key.

## **9.7 Relationships between Tables**

After you have set up different tables for each subject in your database, you need a way of telling MS-Access how to bring the information back together again. The first step in this process is to define relationship between your tables. After you have done that, you can create queries, from and report to display information from several tables at once. A relationship works by matching data in key fields, usually a field with the same name in both tables. In most cases, these matching fields are the primary key (one or more fields that uniquely identify each record in a table) from one table and foreign key (one or more table fields that uniquely identify each record in other table) in other table. There are three possible types of relationships.

**1. One-to-One Relationship:** In this relationship, each record in each table is related to exactly one record in the other table. This type of relationship is not common, because it is more natural to have more than one matching fields.

**2. One-to-Many relationship:** In one-to-many relationship, a record in one of the tables (say the first table) can have more than one matching records in the second table, but a record in the second table have only one record in the first table matching it. This is the most common type of relationship.

**3. Many-to Many Relationships:** In this case, a record in the first table can have many matching records in the second, and a record in the second can have many matching records in the first.

➤ To create a relationship between tables:

1. Close any table you have opened. You can't create or modify relationship between open tables.
2. If you haven't already done so, switch to the **Database** window.
3. Click **Relationship** on the toolbar or from **Tools** menu. The relationship windows will be displayed.
4. If you need to add the tables you want to relate and the **Add Table** dialog box is not displayed, click **Show Table** on the toolbar. If the tables you want to relate are already displayed, skip to step 6.
5. Double-click the name of the table you want to relate, and then close **Add Table/Queries** dialog box.
6. Drag that you want to relate from one table to the related field in the other table.
7. From the **Relationships** dialog box, choose any referential integrity option you want.
8. Click the **Create** button to create the relationship. When you close the Relationships window, Microsoft Access asks you if you want to save the layout. Whether you save the layout or not, the relationships you create are saved in the database.

- To view existing relationships:
  1. Switch to the data window.
  2. Click **Relationship** on the tool bar.
  3. To view all the relationships defined in the database, click **Show All Relationships** on the toolbar.
  4. To view only the relationships defined for a particular table click the table, and then click **Show Direct Relationships** on the tool bar
  
- To delete a relationship:
  1. Close any table you have opened. You can't delete a relationship between open tables.
  2. Switch the **Database window**, if you don't already do so.
  3. Click **Relationships** on the tool bar.
  4. Click the **Relationship** line, for the relationship you want to delete (the line will turn to bold when it is selected) and then press the **Delete** key.

## **9.8 Referential Integrity**

Once a relationship is created, certain operations like deleting some records, changing some values in some records, or adding records in some tables could accidentally damage data. This could affect the validity of relationship. Referential integrity is a set of rules, which does not allow the accidental deletion, or modification of data in the related tables by reminding you the consequences of your action on the related tables. If you delete records or change primary key values in a primary table, Microsoft Access makes necessary changes to related tables to preserve referential integrity.

### **9. Queries**

The real power of database is the ability to see the data you want; in the order you want to see it. A query is a database objects that you create to look for particular information in the database. You use queries to view, change, and analyze data in different ways. With queries you can:

- ✓ **Choose Fields:** you don't have to include all of a table's fields in your query.
- ✓ **Choose Records:** You can specify criteria that records must meet to include in the result.
- ✓ **Sort Records:** you can view records in a specific order.
- ✓ **Ask questions about data in several tables:** You can use a query to answer a question about data from one table and see the result in a single datasheet.
- ✓ **Perform Calculations:** You can create new fields that contain the result of a calculation called calculated fields.
- ✓ **Use as a source of data for forms, reports and other queries:** To select just the right data to display in a form or report, you can create a select query and then use that query as the source of data for the form or report.

#### **10.1 Types of Queries**

In Microsoft Access, you can create different types of queries each designed for a certain purpose.

##### **A. Select Query**

A Select query retrieves data from one or more tables and displays the result in a datasheet where you can update the records (with some restrictions). You can also use a select query to group records and calculate sums, counts, averages, and other types of totals. Microsoft Access's default query is select query since it is the most common type of query.

- To create a simple select query with **Query Wizard**:
1. In the **Database window**, click the **Queries** tab, and then click **New**.
  2. In the **New Query** dialog box, click **Simple Query Wizard**.
  3. Click **Ok**. The **Show Table** dialog box is displayed.
  4. In the **Tables/Queries** drop-down list, choose the table from which you want to select fields.
  5. In the **Available Field** list, click on the field you want to include and click the **>** button to move it to the **Selected Field** list. Do the same for any other field you want to move or click the **>>** button to move all fields at once.
  6. Select another table or query, if desired, and then select the fields you want to use from it.
  7. Repeat this step until you include all the fields you need, and click **Next**.
  8. Access asks whether you want a **Detail** or a **Summery** query. Choose which ever you want and click **Next**.
  9. Enter a title for the query in the **What Title do you want for your Query?** text box.
  10. Click **Finish** to view the query result.

**Note:** The Simple Query Wizard simply selects the fields you want to display. You cannot set criteria for individual fields and you cannot set sort order.

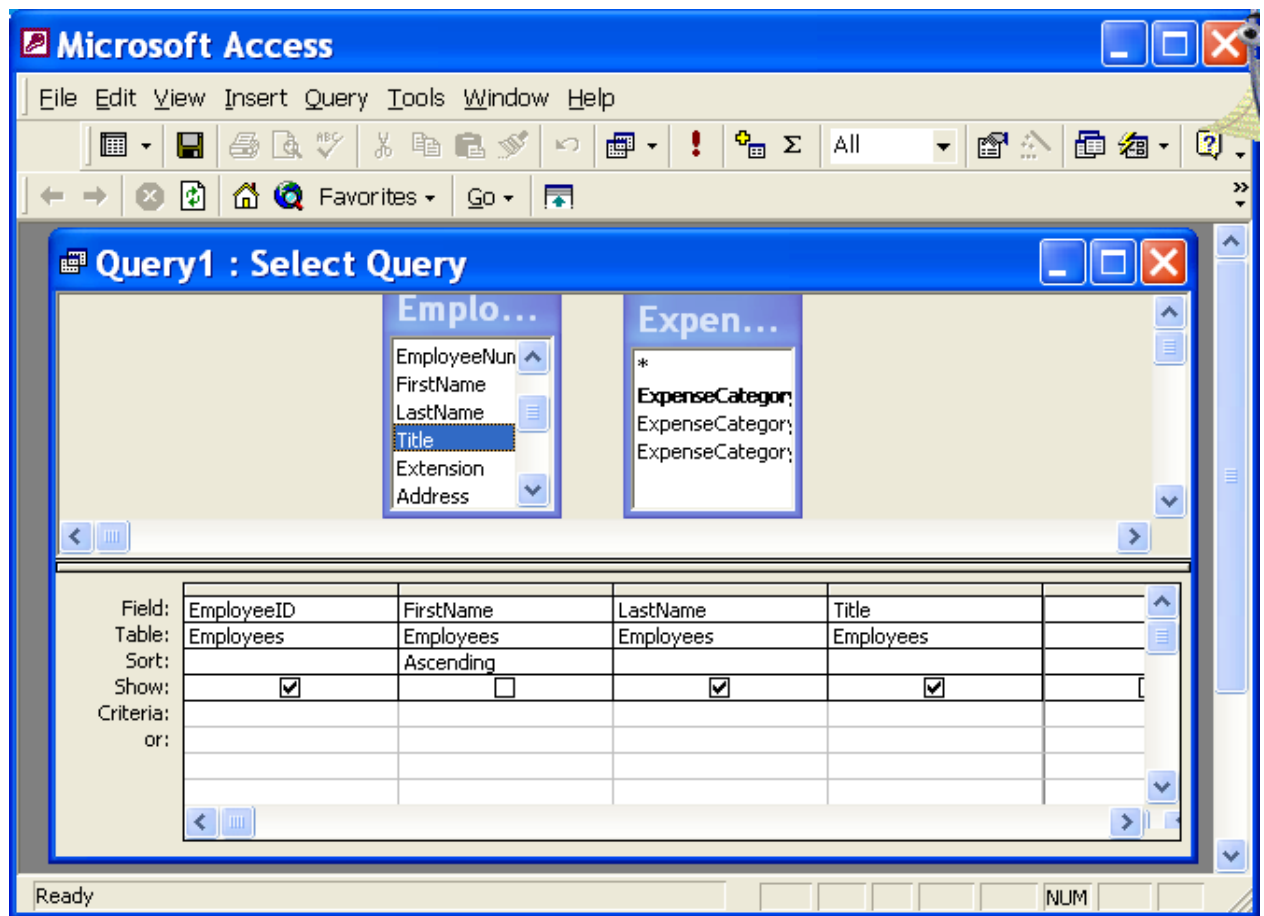
- To create a select query in **Query Design View**:
1. In the database window, click the **Queries** tab and then click **New**.
  2. In the **New Query** dialog box, click **Design view** and then click **Ok**.
  3. In the **Show Table** dialog box, click the tab that lists the objects whose data you want to work with.
  4. Double-click the name of each object (**Table/Query**) you want to add and then close the dialog box.
  5. Add fields to the query by dragging or double-click the field names from the field list to the design grid.

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6. To set criteria for a field that you have added to your query, click the criteria row in the desired field's column and write the criteria.
7. To sort on a field that you have added to your query, click the **Sort** row for the field you want to sort. From the drop-down list that appears, select **Ascending** or **Descending**.
8. To create a calculated field, Click the Field row in a blank field, then use the **Build** button of the toolbar or specify the expression yourself.
9. To see the results of a query, from **View** menu, choose **Datasheet** or click **Run Query (!)** from the toolbar.
10. Save the query.





**Note:** Whenever you add a field to the Design grid, the Show mark is selected, that is it will be displayed in the query result. If you do not want a field displayed in the query result, uncheck the check mark in its show cell.

## **B. Parameter Query**

A parameter query is a query that when run displays its own dialog box, prompting you for information, such as criteria for retrieving records or a value you want to insert in a field.

If you frequently run the same select query but you change the criteria each time you run it, you can save by creating a parameter query. When you run a parameter query, you don't have to open the query window and make changes in the QBE grid, instead, Microsoft Access prompts you for criteria in the **Enter Parameter Value** dialog box. For example, if you often run a query to find the total number of orders by sales person, you could design a parameter query that prompts you for the name of a sales person every time you run the query.

➤ To create a parameter query:

1. Create a query without using a wizard and add the tables you want.
2. In query **Design View**, drag the fields for the query.
3. In the **criteria** cell for each field you want to use as a parameter, type a prompt enclosed in square brackets. Microsoft Access will display this prompt whenever the query runs. The text of the prompt must be different from the field name, although it can include the field name.
4. Choose **Datasheet view**, from the **View** menu, or **standard toolbar**.
5. Enter a value and then click **Ok**.

## **C. Cross tab Queries**

It displays summarized values (sums, counts, and averages) from one field in a table and groups them by one set of facts listed down the left side of the datasheet and click another set of facts listed across the top of the datasheet.

➤ To create a cross tab query without a wizard:

1. In the Database window, click **Queries** under **Objects**, and then click **New**.
2. In the **New Query** dialog box, click **Design View**, and then **Ok**.
3. In the **Show Table** dialog box, select the tables or queries that contain the fields you want to add to your query.
4. Double-click the name of each object you want to add to the query, and then click **Close**.
5. Add the fields to the **Field** row in the **Design** grid and specify criteria.
6. On the **toolbar** or **Query** menu, click **Query type**, and then click **Cross tab**.
7. For the field or fields whose values you want to appear as row headings, click **Cross tab** row and then click **Row Heading**. You must leave the default **Group By** in the total row for those fields.
8. Click the **Cross tab** cell for the field from which you want to take summary values, click the arrow, and then select value from the list in a cross tab query, you can have only one field set to value.
9. Click the **Total** cell from which you want to take summary values, click the arrow, and then select the type of total you want (such as sum, max, or count) from the list. The field you use for values cannot be a **Group By** field; it must contain a total.
10. From the **View** menu, choose **Datasheet** to see the record set.

### **D. Action Queries**

An action query is a query that makes changes to many records in just one operation. There are four types of action queries: make-table, append, update, and delete query.

## **I. Make Table Query**

Creates a new table from all or part of the data in one or more tables. Make-Table queries are helpful for:

- Creating a table to export to other Microsoft Access databases. For example, you might want to create a table that contains several fields from your employees and then export that table to a database used by your personnel department.
  - Making a back-up copy of table.
  - Improving performance of forms, reports, and data access pages based on multiple-table queries or SQL statements.
- To create a new table from the results of a query with a make-table query:
1. Create a query, selecting the tables or queries that contain the records you want to put in the new table.
  2. In query **Design view**, click the arrow next to the **Query Type** on the toolbar, and then click **Make-Table**.
  3. In the **Make-Table** dialog box, enter the name for the table in the **Table Name** dialog box.
  4. Click **Current Database** to put the new table in the currently open database. Or click **Another Database** and type the name of the database you want to put the new table in. Type the path if necessary.
  5. Click **Ok**.
  6. Drag from the **Field** lists to the query design grid, the fields you want in the new table.
  7. In the **Criteria** cell for the fields you have dragged to the grid, type the criteria.
  8. To preview the new table before you create it, click **View** on the toolbar. To return to query **Design View**, and make changes or run the query, click the **View** button on the toolbar.
  9. To create the new table, click **Run** button.

### **II. Append Query**

An Append query adds a group of records from one or more tables. For example, suppose that you acquire some new customers and a database containing a table of information on those customers. To avoid typing all these information in, you would like to append it to your customer's table. Append queries are also helpful for:

- Append fields based on criteria. For example, you might want to append only the names and addresses of customers with outstanding orders.
- Append records when some of the fields in one table don't exist in the other table. An append query will append the data in the matching fields and ignore the others.

➤ To append records from one table to another table using append query:

1. Create a query that contains the table whose records you want to append to another table.
2. Choose **Append Query** from **Query** menu.
3. In the **Table Name** box, enter the name of the table you want to append records to.
4. Click **Current Database**, if the table is in the currently open database. Or click **Another Database** and type the name of the database where the table is stored. Type the path if necessary.
5. Click **Ok**.
6. Drag from the **Field** list to the query **Design grid** the fields you want to append and any fields you want to use for setting criteria. Also you may not want to add the Primary key field, if it has an Autonumber data type. If all the fields in both tables have the same names, you can just drag the asterisk (\*) to the query design grid. However, if you are working in database criteria, you will need to add all the fields instead.
7. If the fields you have selected have the same name in both tables, Microsoft Access automatically fills the matching name in the **Append To** row. If the fields in the two tables don't have the same name, in the **Append To** row, enter the names of the fields in the table you are appending to.

8. In the **Criteria** cell for the fields that you have dragged to the grid, type the criteria on which additions will be made.
9. To preview records that the query will append, click **View** menu and choose **Datasheet**. Then switch to **Design View** and make any changes you want.
10. Click **Run** on the toolbar to add the records.

### **III. Update Query**

Update query makes global changes to a group of records in one or more tables. For example, you can raise prices by 10 percent for all dairy products, or you can raise salaries by 5 percent for the people with in existing tables.

➤ To change records as a group using update query:

1. Create a query, selecting the tables or queries that include the setting criteria.
2. In query **Design** view, click the arrow next to **Query type** on the toolbar, and then click **Update Query** from **Query** menu.
3. Drag from the **Field** list to the **Query Design** grid the fields you want to update or you want to specify criteria.
4. In the **Criteria** cell, specify the criteria if necessary.
5. In the **Update To** cell for the fields you want to update, type the expression or value you want to use to change the fields.
6. To see a list of records that will be updated, click **View** on the toolbar. This list will not show the new values. To return to query **Design View**, click **View** on the toolbar again. Make any changes you want in **Design View**.
7. Click **Run** on the toolbar or **Query** menu to update the records.

### **IV. Delete Query**

Deleting a single record from a table is quite easy. You open the table in **Datasheet** view, locate the record you want to eliminate, and click to the left of the row containing the list of the record to be deleted. Thus high lights the row, and pressing the **Delete key** on your keyboard eliminates the record.

Delete query deletes a group of records from one or more tables. For example, you could use a delete query to remove products that are discontinued or for which there are no orders. With delete queries, you always delete entire records not just selected fields within records.

- To delete records from one table(s) in one-to-one relationships:
  1. Create a new query that contains the tables from which you want to delete records.
  2. In query **Design view**, choose **Delete Query** from **Query** menu.
  3. From the table you want to delete records from, drag the **Field list** into the query **design grid**. **Field** appears in the delete cell under these fields.
  4. To specify criteria for deleting records, drag to the design grid the fields on which you want to set criteria. **Where** appears in the delete cell under these fields.
  5. In the **Criteria** cell for the fields that you have dragged to the grid, type the criteria.
  6. To preview the records that will be deleted, click **View** on the toolbar. To return to query Design view, click **View** on the tool bar again. Make any change **you** want in **Design View**.
  7. Click **Run** on the tool bar to delete the record.

### **10.2 Using Expressions in Queries and Filters**

To limit your query's dynaset, to certain records, you specify criteria for the query. For example, suppose that you want to view only the suppliers from France. You specify a criterion that limits the records to those whose country field is "France". Only records that meet your criterion are included in the dynaset.

When you specify criteria for a query, you use an expression. An expression tells Microsoft Access which records to include in the query's dynaset. To create an expression, you can either type the expression directly into the QBE grid or use the Expression Builder. With the Expression Builder, you can select the components of your expression from lists, and the Expression Builder creates your expression for you.

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\* To specify criteria for a field, in the criteria cell for the field, type an expression or use an Expression Builder.

Some criteria examples.

<b>Field</b>	<b>Expression</b>	<b>Return</b>
ShippCity	“London”	Displays orders shipped to London.
Ship City	“London” or “Hedge End” Shipped to London or Hedge End.	use the Or operator to display orders
Shipped Date	Between #1/5/95# And #1/10/95#	Uses the Beween...And operator to display orders no earlier than 5-Jan-95 and no latter than 10-Jan-95.
Shipped Date	#3/6/95#	Displays orders 6-Mar-95
Ship Country	In(“Canada”,”UK”)	uses the In operator to display orders shipped to Canada or UK.
Shipped Country	Not “USA”	uses the Not operator to display orders shipped to countries other than USA.
Ship Name	Like “S*”	Orders shipped to customers whose.  name starts with the letter S.
Company Name	>=”N”	Displays orders shipped to Companies whose name starts with the letter N through Z.

**Note:** you can specify criteria for more than one field in the criteria row.

1. If you are looking for records that meet both criteria, place both criteria on the same line (row).
2. If you are looking for records that meet one of the two criteria, place the criteria on different lines (rows).

### **10.2 Performing Calculations in Query**

Using the **Total** row in query **Design view**, you can calculate the sum, average, count, minimum, maximum, standard deviation or variance, values in one or more fields either for all the records in a query or for one or more groups of records.

- To calculate a sum, average, count, or other total on all the records in query:
  1. Create a select query in **Design view**. Add the tables whose records you want to use in the calculation, and then add the fields on which you want to perform calculations and specify criteria.
  2. Click **Totals** on the toolbar. Microsoft Access displays the **Total** row in the design grid.
  3. For each field in the design grid, click its cell in the **Total** row, and then click on of the following aggregate functions; Sum, Avg, Min, Max, Count, stdev, or var.
  4. If you want, enter criteria to affect the results of the calculation.
  5. If you want sort the results.
  6. Click **View** on the toolbar to view the results.
- To calculate a sum, average, count, or other total on groups of records in a query:
  1. Create a select query in design view. Add the tables whose records you want to use in the calculation, and then add the fields on which you want to perform calculations, define groupings, and specify criteria.
  2. Click **Totals** on the toolbar. Microsoft Access displays the total row in the Design grid.



3. For the field or fields you want to group on, leave **Group By** in the **Total** cell.
4. For each field you want to calculate, click its cell in the **Total** row and then click one of the following aggregate functions: Sum, Avg, Min, Max, Count stdev, or var.
5. If you want, enter criteria to affect the results of the calculation.
6. If you want, sort the results.
7. Click **View** on the toolbar to view the results.

## **11.Forms**

You can do all your data entry and editing in a table but that may not be the best way. Most people find it easier to create a special on-screen form in which to enter the data. A form resembles any fill-in-the-blanks sheet that you might complete by hand, such as a job application. Microsoft Access links the form to the table and stores the information you put in to the form in the table.

**Forms** let you view, enter edit, and print data in a way that is easier to use than a **datasheet**. You use **Forms** to present or input one record and many records at a time.

In Access, you can attach instructions with Forms to be used during data entry. You can include buttons for making multi-choice entries, Formats for validations of data to prevent erroneous entries, and so on. Variety of design elements such as titles, pictures, lines and color can be used in creating forms. And these are the major advantages of using **Form** than a **Table** or a **Datasheet**. Among the purposes of Access Forms, the followings are the major ones.

- Produce present a form that looks like a paper form you are familiar with.