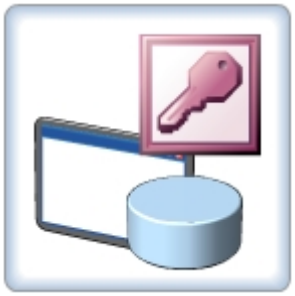
Parks Recreation & Community Services Department

Databases
Lesson 14

Lesson Introduction



Suppose you own a bookshop. To manage it efficiently, you need to keep a detailed record of the books available in your shop. You also want to check the titles and the number of copies available per title so that you can order stock for new titles and restock old titles. You also want to track the overall sales.

You have to store all this information in an organized form so that you can easily retrieve it when required. One way to organize data is to use a database, which is an organized list of data.

You can use a database program, such as Access, to efficiently create and manage a database. Database programs help you add, delete, view, and modify the data stored in a database.

In this lesson, you will learn about the basic tasks that you can perform by using a database program. You will learn how to create and use a database. In addition, you will learn how to generate various types of reports by using queries.

Lesson Objectives

After completing this lesson, you will be able to:

- Explain basic database concepts.
- Create a database.
- Work with records in a database.
- Explain what database queries are and how they work.
- Explain what reports are and their uses.

Topic: Introduction to Databases

Suppose you own a business and you want to keep track of accounts, inventory, and employees. This information is too large to be managed with simple spreadsheets. A database is the best way to manage all this information.

A database contains objects that help you to store, edit, and format information. Data is organized in a database in the form of tables. Two common types of databases are flat file and relational. A flat file database contains all the data in a single table, whereas a relational database stores data in multiple tables.

In relational databases, you can store data in categories using multiple tables. For example, you can keep all the basic contact information of a customer in one table, the products they buy in another, and credit data in another. You can create a link between these three tables by using a common field, such as Customer ID, contained in all the three tables. You can use the database to create a mailing list of all the customers who have bought items from you. You can then send sale brochures to the customers. The database assembles the appropriate data from the tables to give you the information as a single report.

To create databases, establish relationships among multiple tables, and retrieve information, you use a database program, such as Access. A database program helps you perform various functions on the information stored in a database and displays the results in a desired format. For example, you can easily generate a report of the total and average sales of 50 products in five areas by using a query. A query is a database object that enables you to locate the desired information within a database.

In this demonstration, you will learn about basic database concepts.

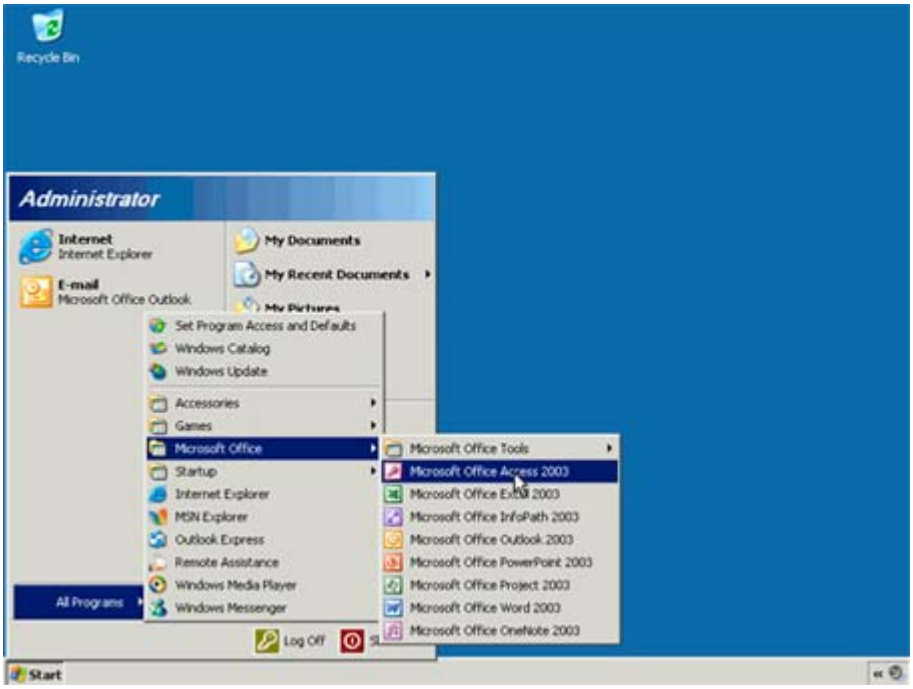
The following table contains the steps and transcript of an online demonstration.

Step List

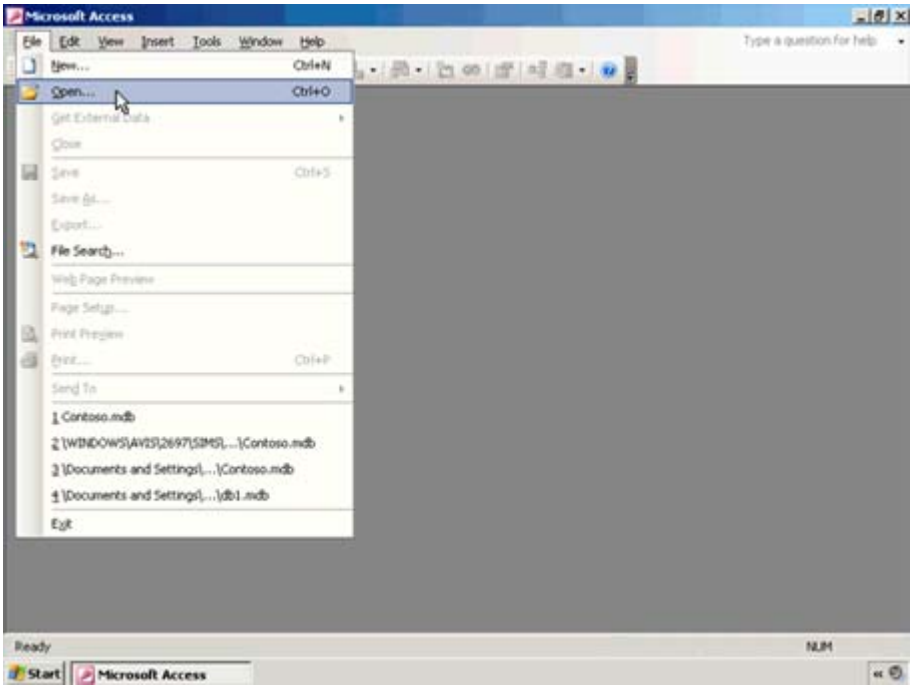
1	Demonstration: Introduction to Databases
2	Click **Start**, point to **All Programs**, point to **Microsoft Office**, and then click **Microsoft Office Access 2003**.
3	To open an existing database, on the **File** menu, click **Open**.
4	To open the Contoso.mdb database, in the **Open** dialog box, under **My Documents**, double-click **Contoso**.
5	To open the Employees table, in the **Database** window, on the **Objects** bar, click **Tables**, click **Employees**, and then on the **Database window** toolbar, click **Open**.

6	To open the Employee by Name query, in the **Database** window, on the **Objects** bar, click **Queries**, click **Employee by Name**, and then on the **Database window** toolbar, click **Open**.
7	To open the Employee Details form, in the **Database** window, on the **Objects** bar, click **Forms**, click **Employee Details**, and then on the **Database window** toolbar, click **Open**.
8	To open the Employee Performance report, in the **Database** window, on the **Objects** bar, click **Reports**, click **Employee Performance**, and then on the **Database window** toolbar, click **Preview**.

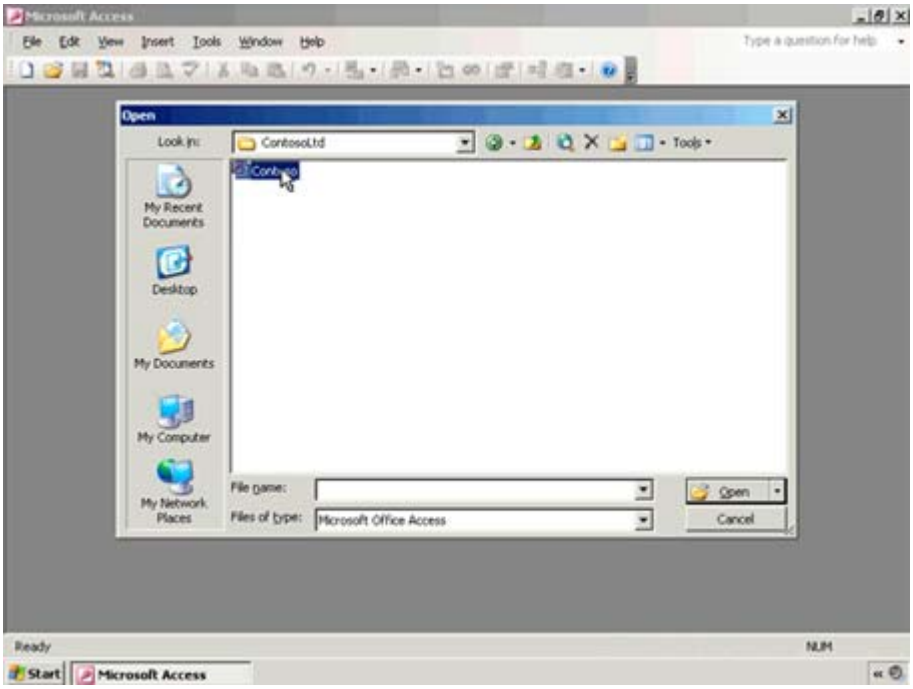
Transcript



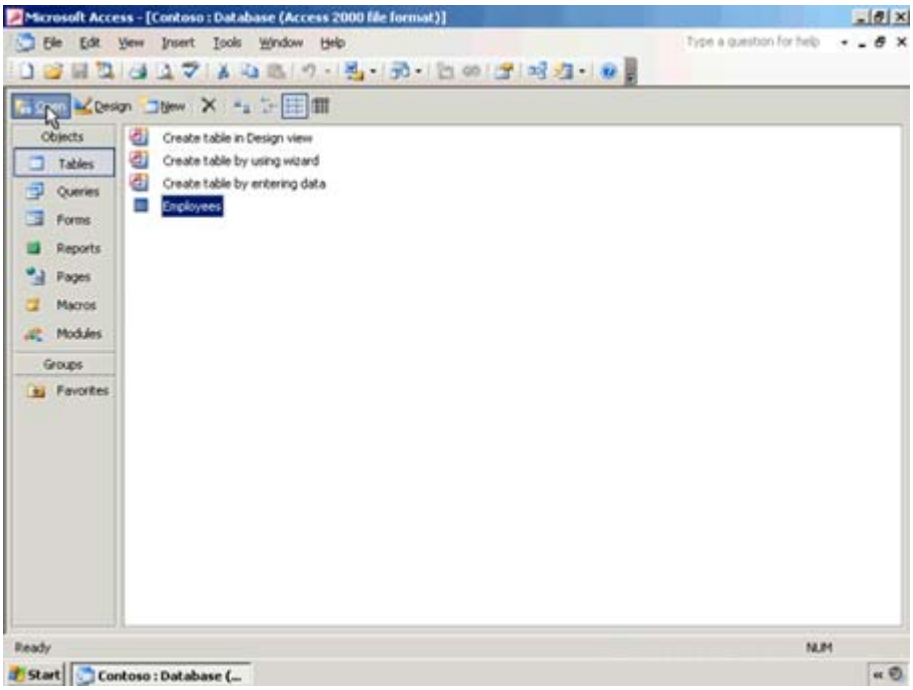
Every organization maintains data related to its customers, employees, or accounts. A school teacher needs to store academic and personal details of students. These details are stored in an organized manner for easy reference. A database is an organized collection of data. A database program allows you to store, organize, and retrieve data. One of the most popular database programs is Access, which allows you to store and manipulate large amounts of data.



You can either create a database or open an existing database to store data. In this demonstration, you open an existing database, Contoso.mdb.

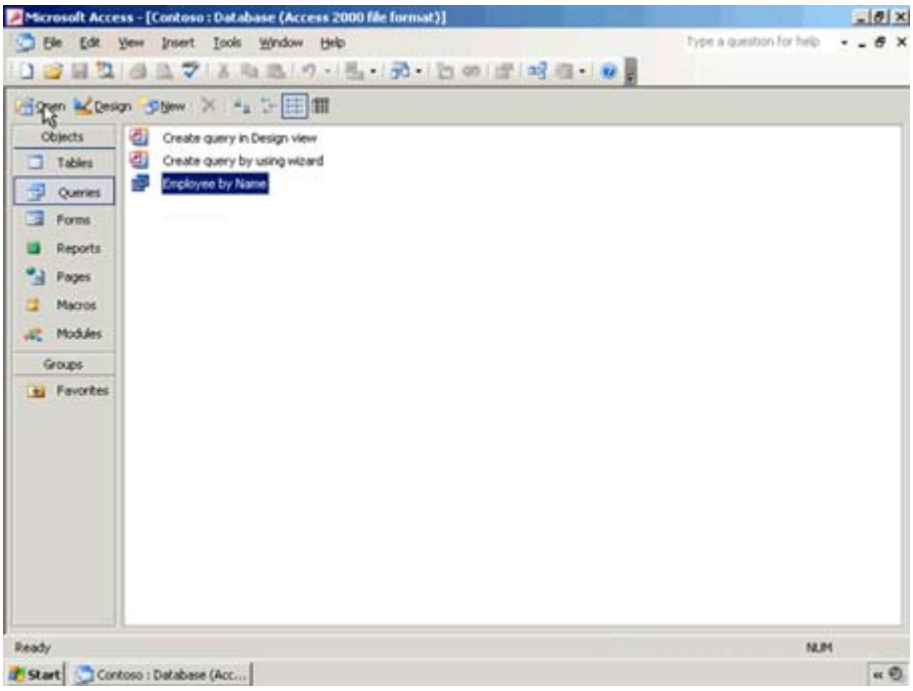


To open the Contoso database, you specify the exact location of the database and select the database name in the Open dialog box.

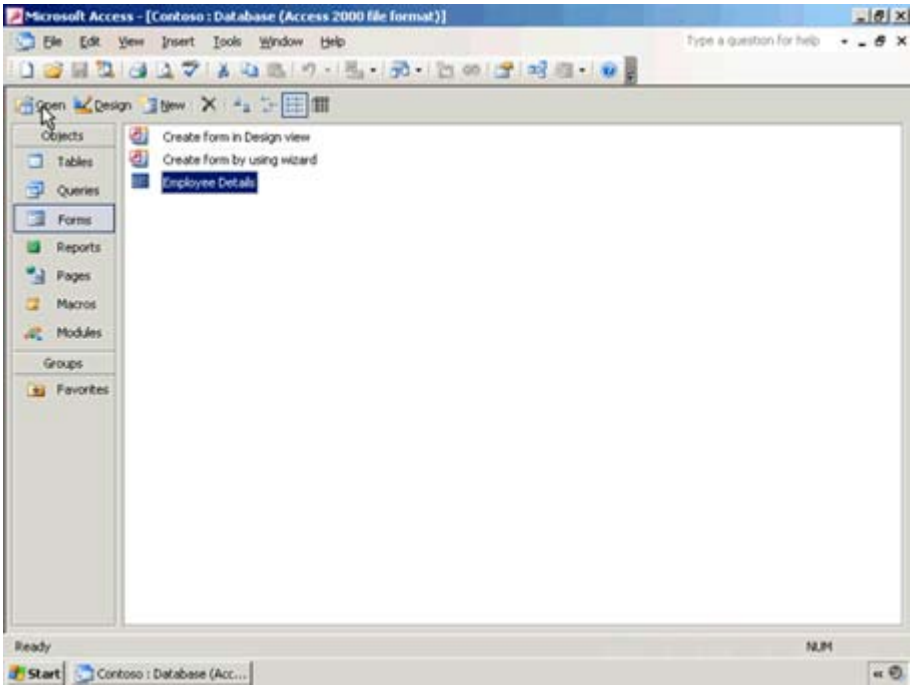


An Access database consists of objects such as tables, queries, reports, and forms. You use tables to store data about a specific category, such as customer or employee details. Data in a table is organized in columns and rows. Each table row that contains information represents a record. Each piece of information in a record is called a field. You can identify a field by a field name, such as Employee Name or Employee Address. In this demonstration, the Employees table is created for you. You can view each object, such as a table, in Design view or Datasheet view. In Design view, you can manually define the structure of database objects. For example, you can use Design view to define the field names and the type of information each field must contain in a table. You can also modify the structure of the existing database objects in Design view. Datasheet view allows you to view a table in the form of

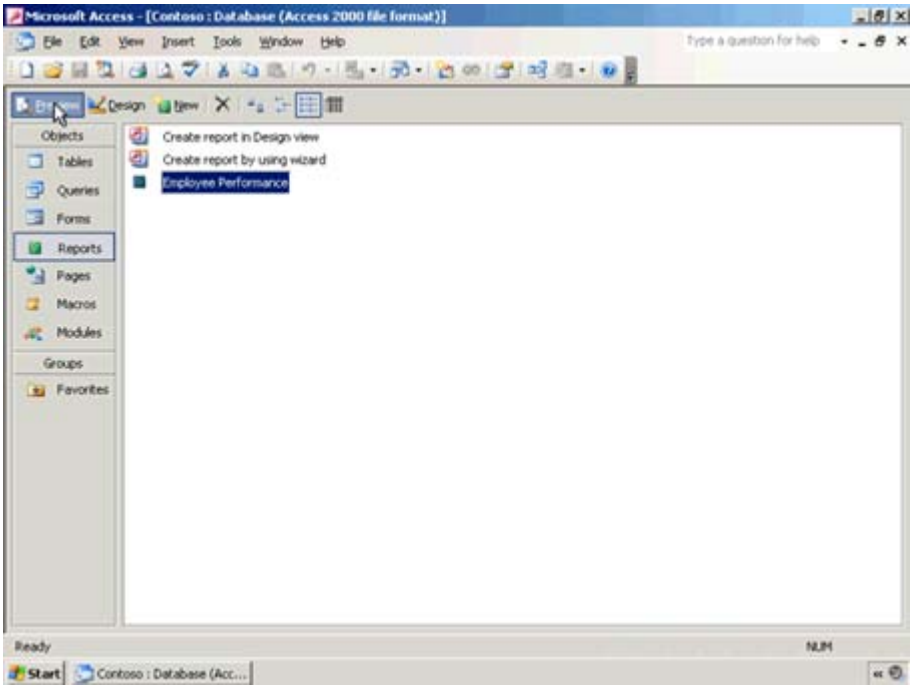
rows and columns. You can add and delete data, edit fields, and search for data in Datasheet view.



The next database object is a query. You use a query to retrieve information from a database based on specific criteria. For example, you can create a query to retrieve the records of an employee whose first name is Michael. You can create a query or open an existing query. Opening an existing query is also described as running a query. In this demonstration, the Employee by Name query is created for you.



Another database object is a form. You use a form to edit or enter new records in a table. In this demonstration, the Employee Details form is created for you. In this form, you can add or edit the employee details, such as employee ID, first name, and last name. The details are added to the Employees table.



A report is an effective way to present your data in a printed format. You use reports to present data retrieved from tables or queries. You can change the appearance of data in a report to display it in the way you want to see it. For example, you can insert page breaks or bullets in a report. However, you cannot add or edit data by using reports.

Topic: Creating a Database

You own a bakery and want to track the sales of each food product in your bakery. You also want to find out the sales trends of each product so that you know which products your customers like the most. You also want to keep a record of all your customers' details, so that you can send them e-mail messages about any special offers.

It can be a very tedious task to maintain such records manually. An easier method is to use a database program, such as Access, to create and efficiently manage this information. You can use the Database Wizard and the Table Wizard to create a new database with tables in Access.

In this topic, you will learn to create a new database. For the purpose of the exercise in this topic, consider that you are the owner of Northwind Traders. You need to create a database to maintain the company's data and want to familiarize yourself with the database that you have created. You also want to create a Customers table to store customer information.

The following table contains the steps of an online simulation.

Step 1 To open Access, click **Start**, point to **All Programs**, point to **Microsoft Office**, and then click **Microsoft Office Access 2003**.
Step 2 To view the New File task pane, click **Getting Started** and then click the **New File** button, as indicated.
Step 3 To create a blank database, in the New File task pane, under **New**, click **Blank database**.
Step 4 The File New Database dialog box appears. You need to specify the name and the location of the database in the File New Database dialog box. To specify where you want to store the new database, in the **File New Database** dialog box, double-click **Northwind Traders**, and then double-click **Database**.

Step 5

You want to rename the default database name. To replace the default database name with Northwind Traders, select the default file name in the **File name** box, press SPACEBAR to have the new name typed for you, and then click **Create**.

Step 6

You have created a new database and you now want to add new records in the database. To verify that there are no existing objects in the database, on the **Objects** bar, click **Queries**, click **Forms**, and then click **Reports**.

Step 7

To create a table in the Northwind Traders database, click **Tables**, and then on the **Database** toolbar, click the **New** button.

Step 8

To start the Table Wizard, in the **New Table** dialog box, click **Table Wizard**, and then click **OK**.

Step 9

To create a table to store customer details, on the first page of the Table Wizard, you can review a set of sample fields and then choose the appropriate fields. In this exercise, leave the **Business** category selected, and then click **Customers**, as indicated.

Step 10

You can select the fields for your new table from the sample fields available in the Sample Fields list. To copy a field from the Sample Fields list to the Fields in my new table list, verify that **CustomerID** is selected, and then click the > button.

Step 11

You want to rename the field CustomerID to Cust ID. To rename the new field, click the **Rename Field** button, and then press SPACEBAR to have the name typed for you, click **OK**, and then click **Next**.

Step 12

To provide a name for your table, in the **What do you want to name your table?** box, press SPACEBAR to have the table name typed for you.

Step 13

Each record in a table needs to be uniquely identified to prevent entry of duplicate records in the database. To do this, you must set the primary key field on a field that contains unique values. To specify the primary key, click **No, I'll set the primary key**, and then click **Next**.

Step 14

To set the primary key on Cust ID, on the next page of the Table Wizard, the Cust ID field is already selected. To specify the type of data for the primary key field, click **Numbers and/or letters I enter when I add new records**, and then click **Next**.

Step 15

Note that Enter data directly into the table is the default selection. To finish creating the table in the wizard and open it in Datasheet view, click **Finish**.

Step 16

The Customer Details table opens in Datasheet view. You can use Datasheet view to enter values in the fields. To specify a value for customer ID, click in the first cell under **Cust ID**, and press the SPACEBAR to have the customer ID typed for you.

Step 17 To save the table, on the **Standard** toolbar, click the **Save** button.
Step 18 To close the table, on the Customer Details Table title bar, click the **Close** button.
Step 19 To close the database, on the menu bar, click the **Close Window** button.

Topic: Working with Records

You own a bakery and have created a database containing its sales and customer information. You now want to add new sales information to the existing database by using an order form. The order form lists the product name, quantity ordered, price of each product, and the total amount of the order. You also want to modify or delete customer records when you enter incorrect data.

You can use a database program, such as Access, to create, edit, and delete data entered in a database. You can also sort and filter the data stored in the database. For example, you can filter the data in a database to view only those products for which the minimum quantity ordered was more than 10. You can also sort the records on the basis of product ID to view the result in alphabetical order.

In this topic, you will learn to work with records in a database. For the purpose of the exercise in this topic, you have to manage the inventory in a computer outlet. An Access file is already created to manage the inventory details. You now need to enter a new record, and also edit and delete some existing records. You also need to sort the table records according to the product IDs. In addition, you want to check the records for those products whose quantity is 10 in number so that you can place orders for new stock.

The following table contains the steps of an online simulation.

Step 1 Access has been opened for you. To open an existing database, on the **File** menu, click **Open**.
Step 2 To select the Products database, in the **Open** dialog box, double-click **Products**.
Step 3 To acknowledge the security warning, in the **Security Warning** message box, click **Open**.
Step 4 To start entering a new record by using the Order form, in the Products : Database (Access 2000 file format) window, under Objects, click **Forms**, and then double-click **Order**.
Step 5 To add a new record, in the **Product ID** field, press SPACEBAR to have the text typed for you.

Step 6

You may want to modify an incorrect value you accidentally entered in a record. To edit the quantity of personal computers in the record, double-click in the **Quantity** field, and then press SPACEBAR to have the text typed for you.

Step 7

After updating the form, you now want to close it. To close the form, in the **Order** window, click the **Close** button, as indicated.

Step 8

You can also add, edit, or delete records by using tables. To select a table, under **Objects**, click **Tables**, and then double-click **Order**.

Step 9

To delete the first record in the datasheet, on the Formatting toolbar, click the **Delete Record** button, as indicated, and then in the **Microsoft Office Access** warning box, click **Yes**.

Step 10

You can also sort records either in ascending or descending order. To sort the records in a table, you have to select a criterion for sorting. To select the **Product ID** as a criterion for sorting the table records, click the **Product ID** column heading.

Step 11

The **Product ID** column is selected. To sort the table records by Product ID in ascending order, on the **Table Datasheet** toolbar, click the **Sort Ascending** button, as indicated.

Step 12

Alternatively, to sort the table records by the Product ID in descending order, on the **Table Datasheet** toolbar, click the **Sort Descending** button, as indicated.

Step 13

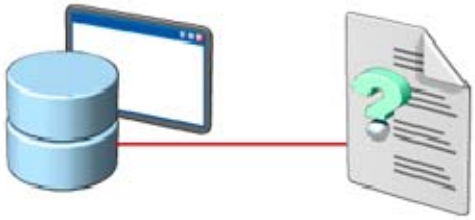
In a large table, it may be difficult to locate a list of specific records. For example, you may want to view a list of products running low on stock so that you can place an order for new stock. In such cases, you can use the filter functions provided in Access. You can filter records that fulfill a specific criterion. To filter the table records for products with quantity equal to 10, click the first instance of **10** in the **Quantity** column, and then, on the **Table Datasheet** toolbar, click the **Filter By Selection** button, as indicated.

Step 14

To remove the filter, on the **Table Datasheet** toolbar, click the **Remove Filter** button, as indicated.

Topic: Database Queries

The following table contains the transcript of an online animation.



You use a query to retrieve specific information from a database. A query is a question that you enter in a database program. The database program then performs the required operations to present the answer in the form of a report. A query helps you view specific data to modify or analyze it.

Suppose you own a bakery. You store detailed information about your customers in a Customer table and data about the sales of all the products in a Product table in a database.

You now want to know which flavor of pastries is less popular in the area with postal code 97001 so that you can introduce a special offer on the less popular flavor to increase its sales.

You can use a query to retrieve sales details to help you make this decision. You can create a query in Design view or by using a wizard.

You then select the tables from which you want to search data. The common fields in the tables are shown as connected.

Queries work on search conditions called filters to retrieve specific information from a database. You can specify the fields on which you want to base your query in the Criteria field, such as postal code.

You can also drag other fields that are a part of the query. You can clear the boxes in the Show field for the fields you do not want to view in the report.

The result of the query appears as a report. This report contains the sales details of all the pastry flavors sold in the area with the postal code 97001.

A database program also allows you to sort the displayed information on the basis of a specific field. For example, you can arrange the results of the query on the basis of the pastry flavor.

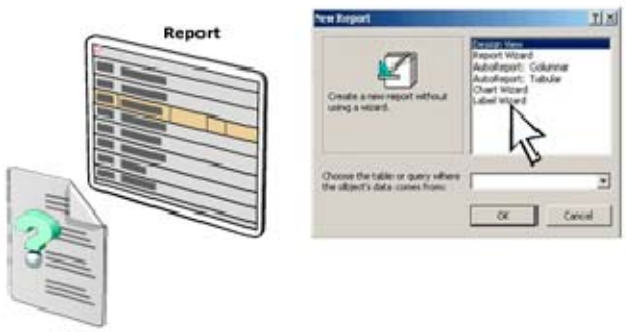
You can also easily create queries by using the Simple Query Wizard.

Database programs, such as Access, also help you to create complex queries that contain functions. The query performs the mathematical function and the result is displayed in the report.

For example, you can create a query that calculates product of the quantity and the unit price to show total sales of a particular pastry flavor.

Topic: Working with Reports

The following table contains the transcript of an online animation.



You can create reports in a database program, such as Access, to organize, summarize, and perform calculations on data stored in a database.

Suppose you want to generate a report that contains the Product ID, Product Name, Unit Cost, and Quantity of all the products listed in the Inventory database. You can create such a report by using Access.

You can create a report in Design view or by using a wizard. You can also create a report by using AutoReport, the Report Wizard, the Chart Wizard, or the Label Wizard.

You can view your data in the report in either columnar or tabular format. The columnar report displays one record at a time with each field in a new row. The tabular report displays multiple records on a page, with all fields for a specific record in the same row.

The Chart Wizard helps you generate the reports in the form of charts. Similarly, the Label Wizard helps create a report using labels.

To generate a report, you will have to run a query. The results of the query then appear within the report.

The wizard helps you select the fields that you want to display in the report.

You can also select the format in which you want the report to appear. In addition, you can sort the records displayed in the report by up to four fields. The wizard also helps you select the layout and appearance of the generated report.