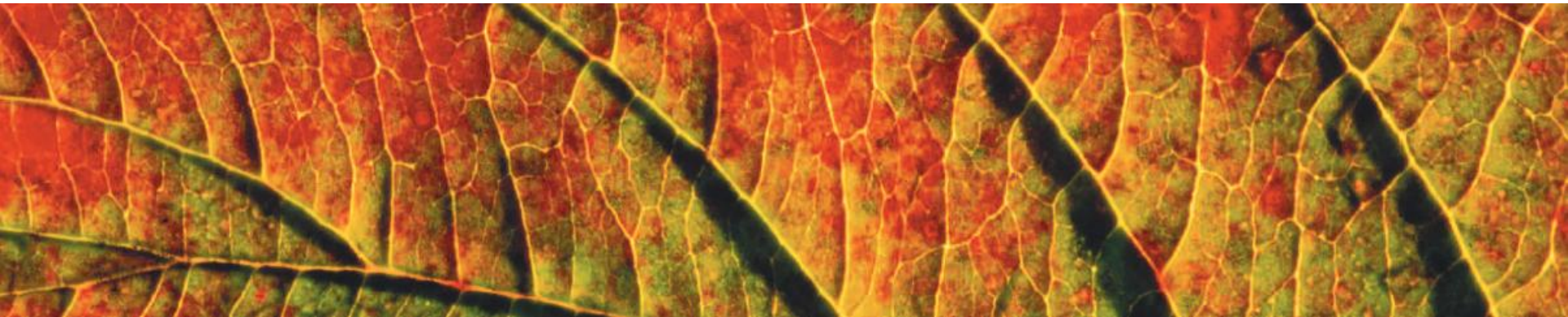# Access Tutorial 2

Building a Database and Defining Table Relationships

Microsoft® Office 2010

Objectives

- Learn the guidelines for designing databases and setting field properties

- Modify the format of a field in Datasheet view

- Create a table in Design view

- Define fields and specify a table's primary key

- Modify the structure of a table

Objectives

- Import data from an Excel worksheet
- Create a table by importing an existing table structure
- Add fields to a table with the Data Type gallery
- Delete, rename, and move fields
- Add data to a table by importing a text file
- Define a relationship between two tables

Table Window in Design View

The default name for a new table you create in Design view is Table1. This name appears on the tab for the new table.

The top portion of the Table window in Design view is called the **Table Design grid**. Here, you enter values for the Field Name, Data Type, and Description field properties.

After you assign a data type to a field, the General tab displays additional field properties for that data type. Initially, most field properties are assigned default values.

When defining the fields in a table, you can move from the Table Design grid to the Field Properties pane by pressing the **F6** key.

In the Field Name column, you enter the name for each new field in the table. When you first open a new Table window in Design view, Field Name is the current property.

In the Data Type column, you select the appropriate data type for each new field in the table. The data type determines what field values you can enter for a field and what other properties the field will have. The default data type for a new field is Text.

Design view allows you to define or modify a table structure or the properties of the fields in a table.

You can use the **Description property** to enter an optional description for a field to explain its purpose or usage. A field's Description property can be up to 255 characters long, and its value appears on the status bar when you view the table datasheet.

The bottom portion of the Table window in Design view is called the **Field Properties pane**. Here, you select values for all other field properties, most of which are optional.

The purpose or characteristics of the current property (Field Name, in this case) appear in this section of the Field Properties pane.

You can display more complete Help information about the current property by pressing the F1 key.

Guidelines for Designing Databases

- Identify all the fields needed to produce the required information

- Organize each piece of data into its smallest useful part

- Group related fields into tables

- Determine each table's primary key

- Include a common field in related tables

- Avoid data redundancy

- Determine the properties of each field

Guidelines for Setting Field Properties

- You must name each field, table, and other object

- Choose an appropriate data t

Figure 2-4	Common data types	
Data Type	**Description**	**Field Size**
Text	Allows field values containing letters, digits, spaces, and special characters. Use for names, addresses, descriptions, and fields containing digits that are not used in calculations.	0 to 255 characters; default is 255
Memo	Allows field values containing letters, digits, spaces, and special characters. Use for long comments and explanations.	1 to 65,535 characters; exact size is determined by entry
Number	Allows positive and negative numbers as field values. Numbers can contain digits, a decimal point, commas, a plus sign, and a minus sign. Use for fields that will be used in calculations, except those involving money.	1 to 15 digits
Date/Time	Allows field values containing valid dates and times from January 1, 100 to December 31, 9999. Dates can be entered in month/day/year format, several other date formats, or a variety of time formats, such as 10:35 PM. You can perform calculations on dates and times, and you can sort them. For example, you can determine the number of days between two dates.	8 bytes
Currency	Allows field values similar to those for the Number data type, but is used for storing monetary values. Unlike calculations with Number data type decimal values, calculations performed with the Currency data type are not subject to round-off error.	Accurate to 15 digits on the left side of the decimal point and to 4 digits on the right side
AutoNumber	Consists of integer values created automatically by Access each time you create a new record. You can specify sequential numbering or random numbering, which guarantees a unique field value, so that such a field can serve as a table's primary key.	9 digits
Yes/No	Limits field values to yes and no, on and off, or true and false. Use for fields that indicate the presence or absence of a condition, such as whether an order has been filled or whether an invoice has been paid.	1 character
Hyperlink	Consists of text used as a hyperlink address, which can have up to four parts: the text that appears in a field or control; the path to a file or page; a location within the file or page; and text displayed as a ScreenTip.	Up to 65,535 characters total for the four parts of the Hyperlink data type

Guidelines for Setting Field Properties

- The **Field Size property** defines a field value's maximum storage size for Text, Number, and AutoNumber fields only
  - Byte
  - Integer
  - Long Integer
  - Single
  - Double
  - Replication ID
  - Decimal

Changing the Format of a Field in Datasheet View

Figure 2-5   Contract table datasheet

Text field values are left-aligned

Currency and Date/Time field values are right-aligned

Figure 2-6   Format of the ContractAmt field

Currency data type and Currency format

click to reduce the number of decimal places displayed

click to change the format of the field values

Creating a Table in Design View

- Creating a table in Design view involves entering the field names and defining the properties for the fields, specifying the primary key, and saving the table structure

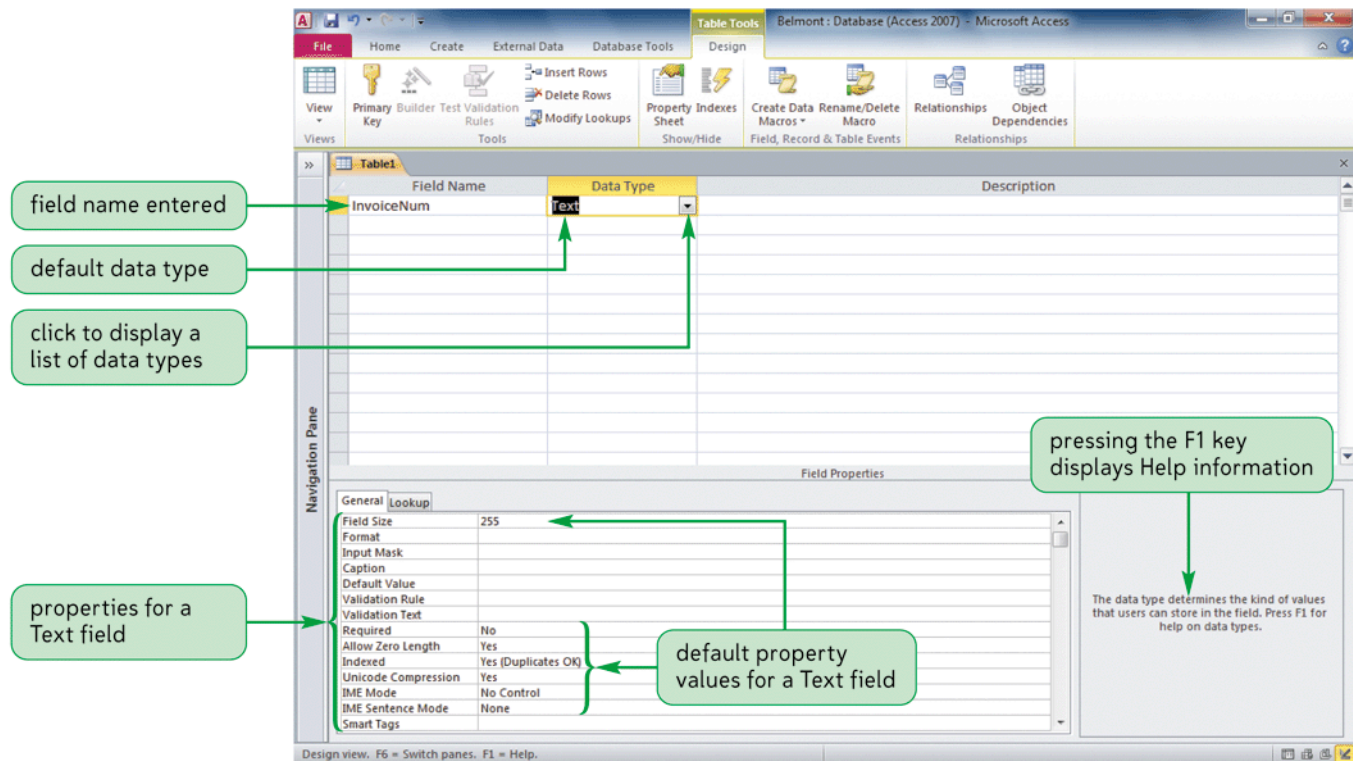| Figure 2-9 | Design for the Invoice table |

Field Name	Data Type	Field Size	Description	Other
InvoiceNum	Text	4	Primary key	Caption = Invoice Num
ContractNum	Text	4	Foreign key	Caption = Contract Num
InvoiceAmt	Currency			Format = Currency
				Decimal Places = 2
				Caption = Invoice Amt
InvoiceDate	Date/Time			Format = mm/dd/yyyy
				Caption = Invoice Date
InvoicePaid	Yes/No			Caption = Invoice Paid
				Format = Yes/No

Defining a Field in Design View

- In the Field Name box, type the name for the field, and then press the Tab key

- Accept the default Text data type, or click the arrow and select a different data type for the field. Press the Tab key

- Enter an optional description for the field, if necessary

- Use the Field Properties pane to type or select other field properties, as appropriate

Defining a Field in Design View

Figure 2-10   Table window after entering the first field name

field name entered

default data type

click to display a list of data types

properties for a Text field

pressing the F1 key displays Help information

default property values for a Text field

The data type determines the kind of values that users can store in the field. Press F1 for help on data types.

Specifying the Primary Key in Design View

- Display the table in Design view

- Click in the row for the field you've chosen to be the primary key to make it the active field. If the primary key will consist of two or more fields, click the row selector for the first field, press and hold down the Ctrl key, and then click the row selector for each additional primary key field

- In the Tools group on the Design tab, click the Primary Key button

Specifying the Primary Key in Design View

Figure 2-16   InvoiceNum field selected as the primary key

Primary Key button

key symbol indicates the table's primary key
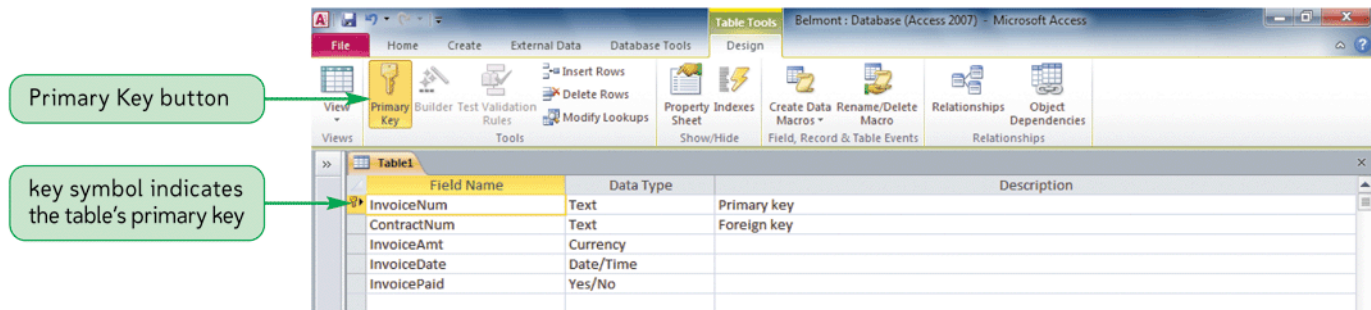
Moving a Field

- To move a field, you use the mouse to drag it to a new location in the Table window in the Table Design grid

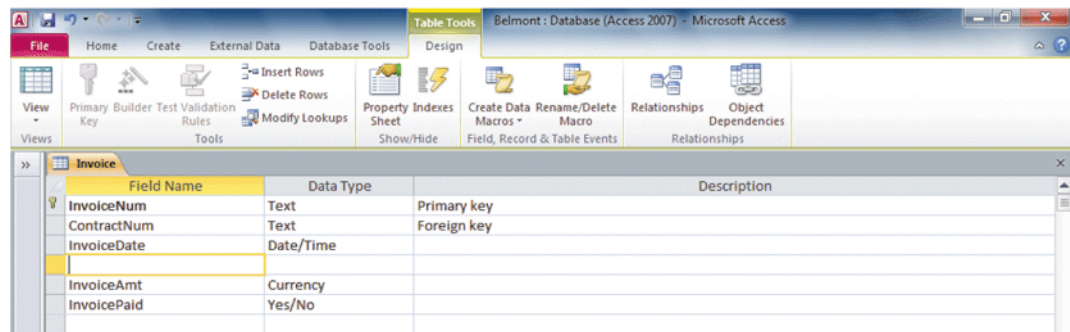Figure 2-17   Moving the InvoiceAmt field in the table structure
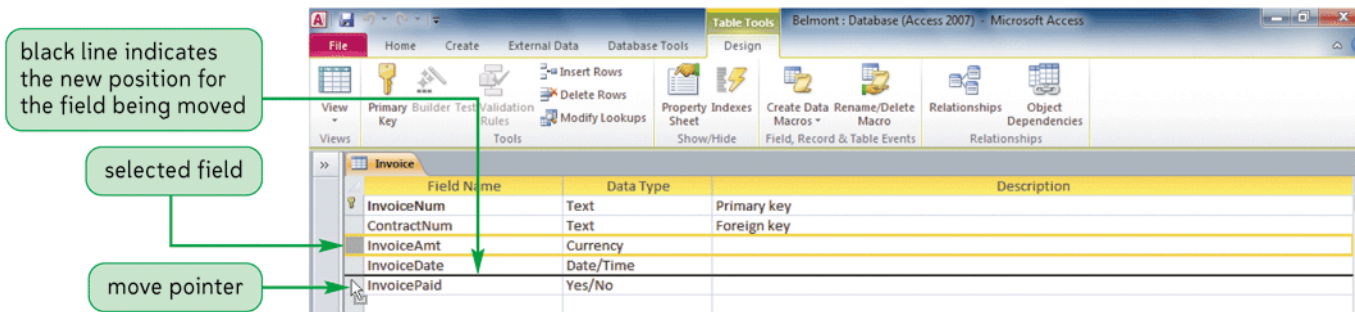
Adding a Field
Between Two Existing Fields

- In the Table window in Design view, select the row below where you want the new field to be inserted

- In the Tools group on the Design tab, click the Insert Rows button

- Define the new field by entering the field name, data type, optional description, and any property specifications

Adding a Field Between Two Existing Fields

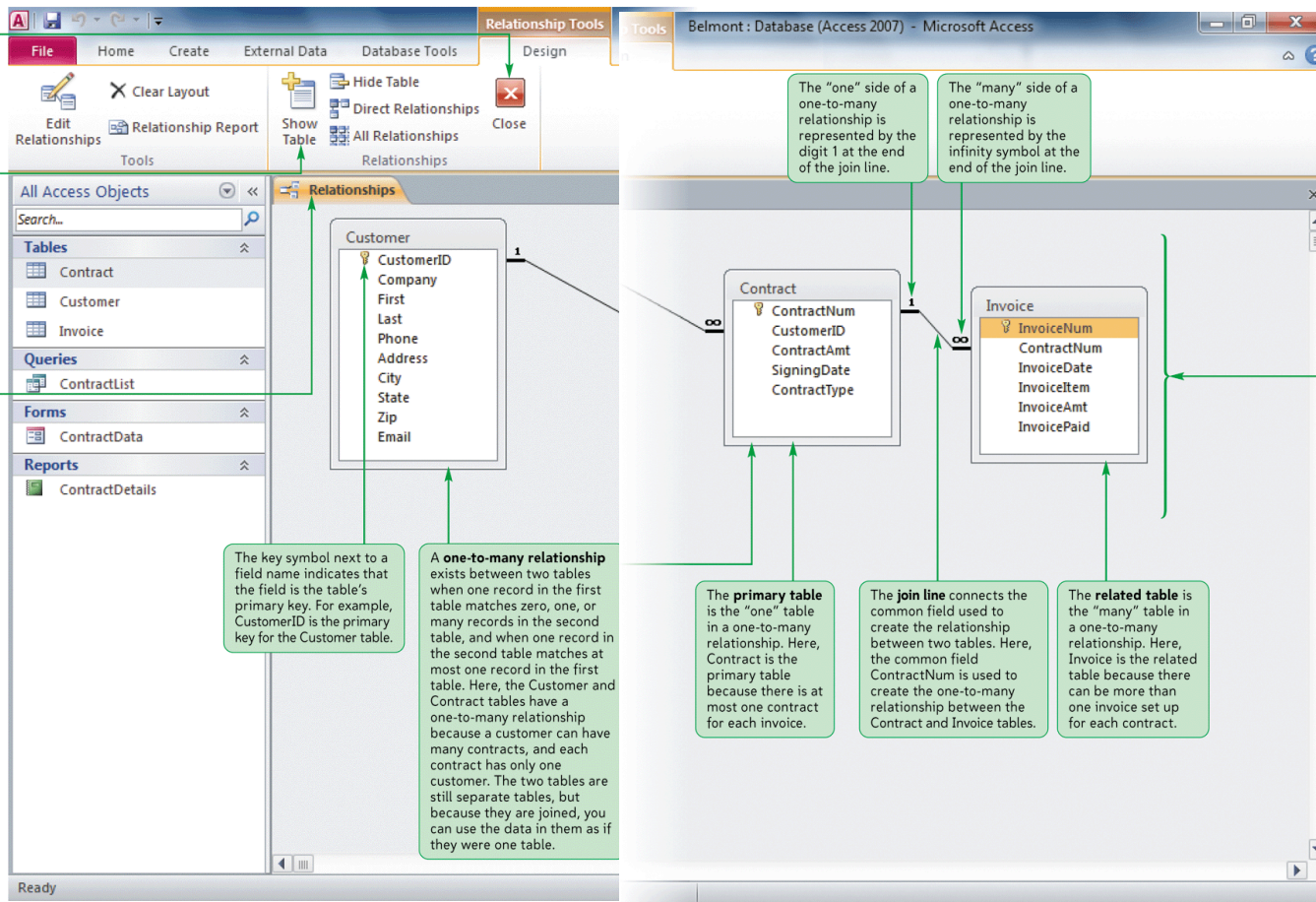Figure 2-18   Table structure after inserting a row

Table Relationship

Click the Close button to close the Relationships window.

You click the **Show Table button** to open the Show Table dialog box. From there, you can choose a table to add to the Relation-ships window.

The **Relationships window** illustrates the relationships among a database's tables. Using this window, you can view or change existing relationships, define new relationships between tables, and rearrange the layout of the tables in the window.

The key symbol next to a field name indicates that the field is the table's primary key. For example, CustomerID is the primary key for the Customer table.

A **one-to-many relationship** exists between two tables when one record in the first table matches zero, one, or many records in the second table, and when one record in the second table matches at most one record in the first table. Here, the Customer and Contract tables have a one-to-many relationship because a customer can have many contracts, and each contract has only one customer. The two tables are still separate tables, but because they are joined, you can use the data in them as if they were one table.

The "one" side of a one-to-many relationship is represented by the digit 1 at the end of the join line.

The "many" side of a one-to-many relationship is represented by the infinity symbol at the end of the join line.

When you add a table to the Relationships window, the fields in the table appear in a **field list**. Here, the window contains three field lists, one for each table: Customer, Contract, and Invoice.

The **primary table** is the "one" table in a one-to-many relationship. Here, Contract is the primary table because there is at most one contract for each invoice.

The **join line** connects the common field used to create the relationship between two tables. Here, the common field ContractNum is used to create the one-to-many relationship between the Contract and Invoice tables.

The **related table** is the "many" table in a one-to-many relationship. Here, Invoice is the related table because there can be more than one invoice set up for each contract.
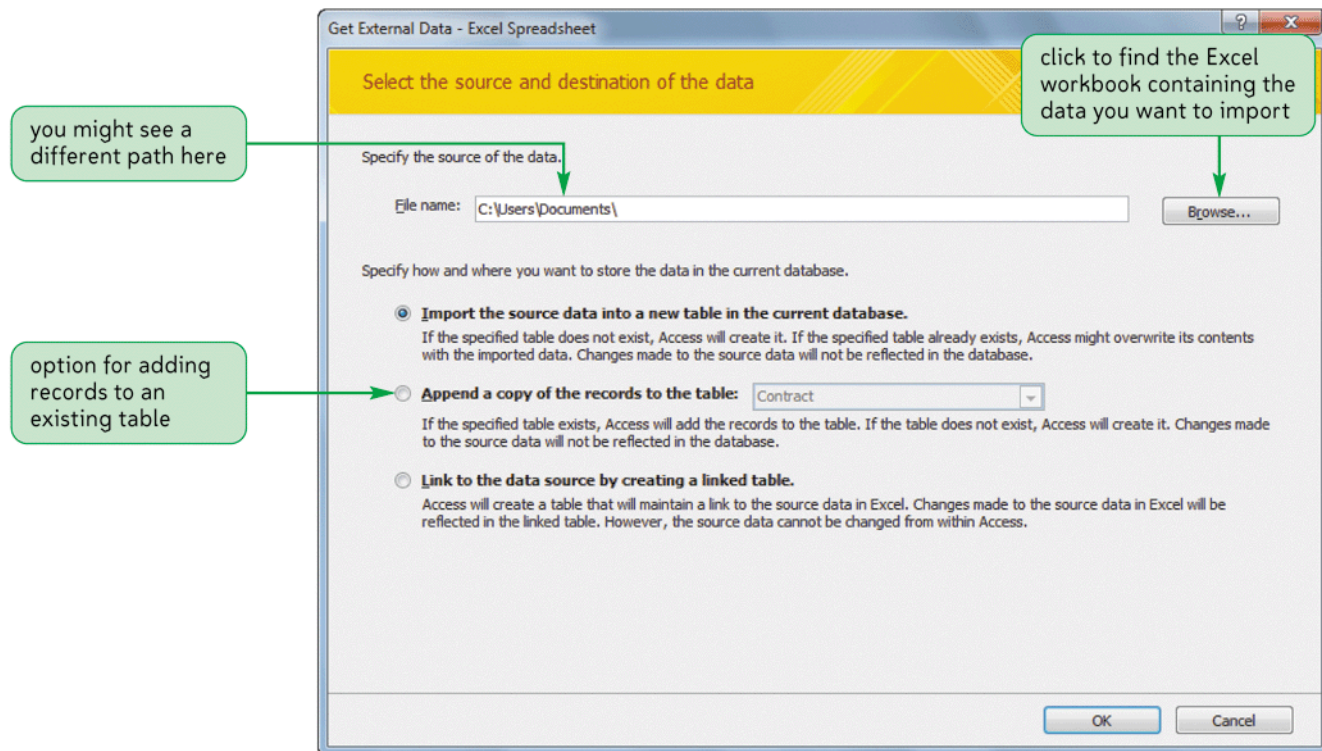
Importing Data from an Excel Worksheet

- The **import** process allows you to copy the data from a source without having to open the source file

- Click **External Data** on the Ribbon

- Click the **Excel** button in the Import & Link group to start the wizard
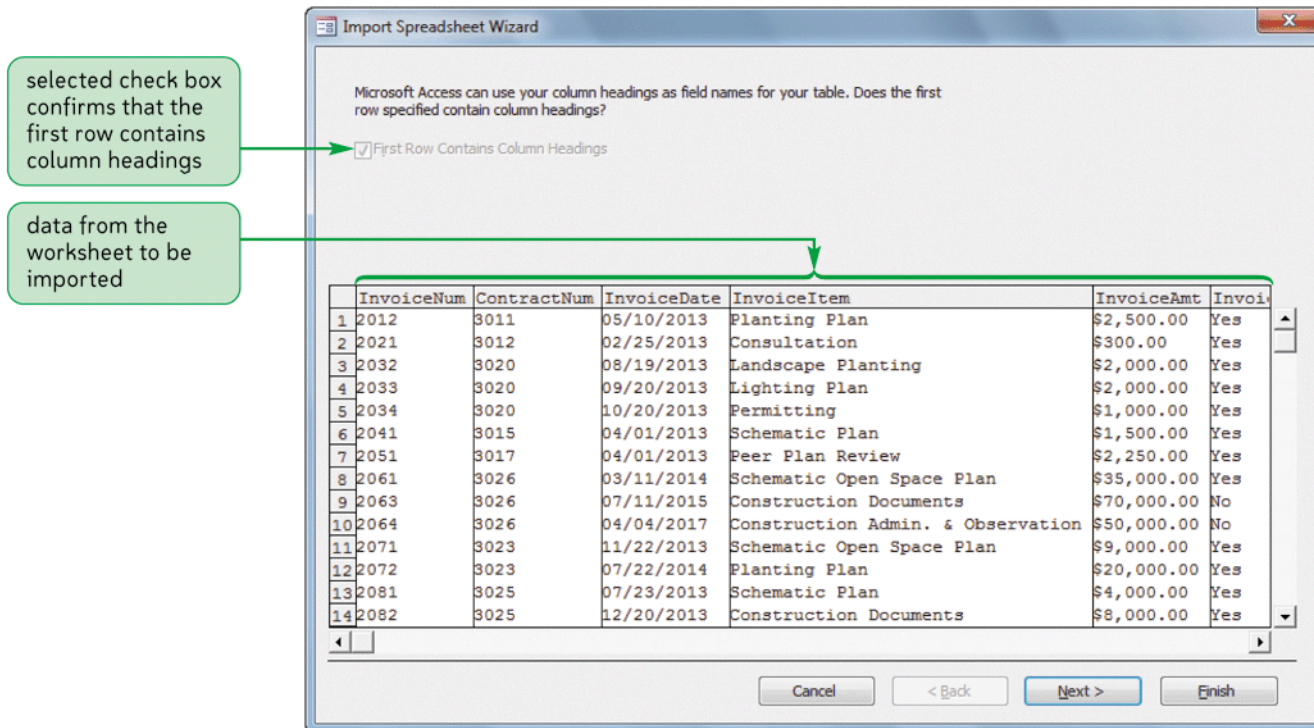
Importing Data from an Excel Worksheet

Figure 2-23   **Get External Data - Excel Spreadsheet dialog box**

Importing Data from an Excel Worksheet

Figure 2-24 — First Import Spreadsheet Wizard dialog box

selected check box confirms that the first row contains column headings

data from the worksheet to be imported

Importing Data from an Excel Worksheet

Figure 2-25 Invoice table after importing data from Excel

Creating a Table by Importing an Existing Table Structure

- Make sure the External Data tab is the active tab on the Ribbon

- In the Import & Link group, click the **Access** button

- Click the **Browse** button

- Navigate to the file

- Make sure the **Import tables, queries, forms, reports, macros, and modules into the current database** option button is selected, and then click the **OK** button

- Click the **Options** button

Creating a Table by Importing an Existing Table Structure


Figure 2-27   Import Objects dialog box
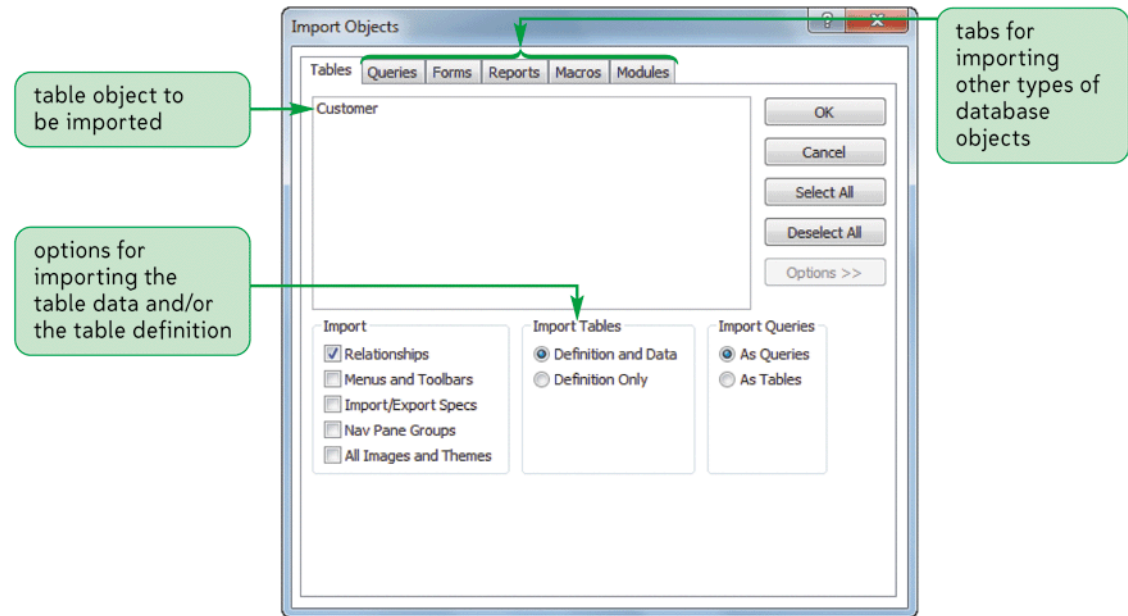
Adding Fields to a Table Using the Data Type Gallery

- The **Data Type gallery**, available in the Add & Delete group on the Fields tab, allows you to add a group of related fields to a table at the same time, rather than adding each field to the table individually

- The group of fields you add is called a **Quick Start selection**

Adding Fields to a Table Using the Data Type Gallery

Figure 2-29 Customer table with the Data Type gallery displayed
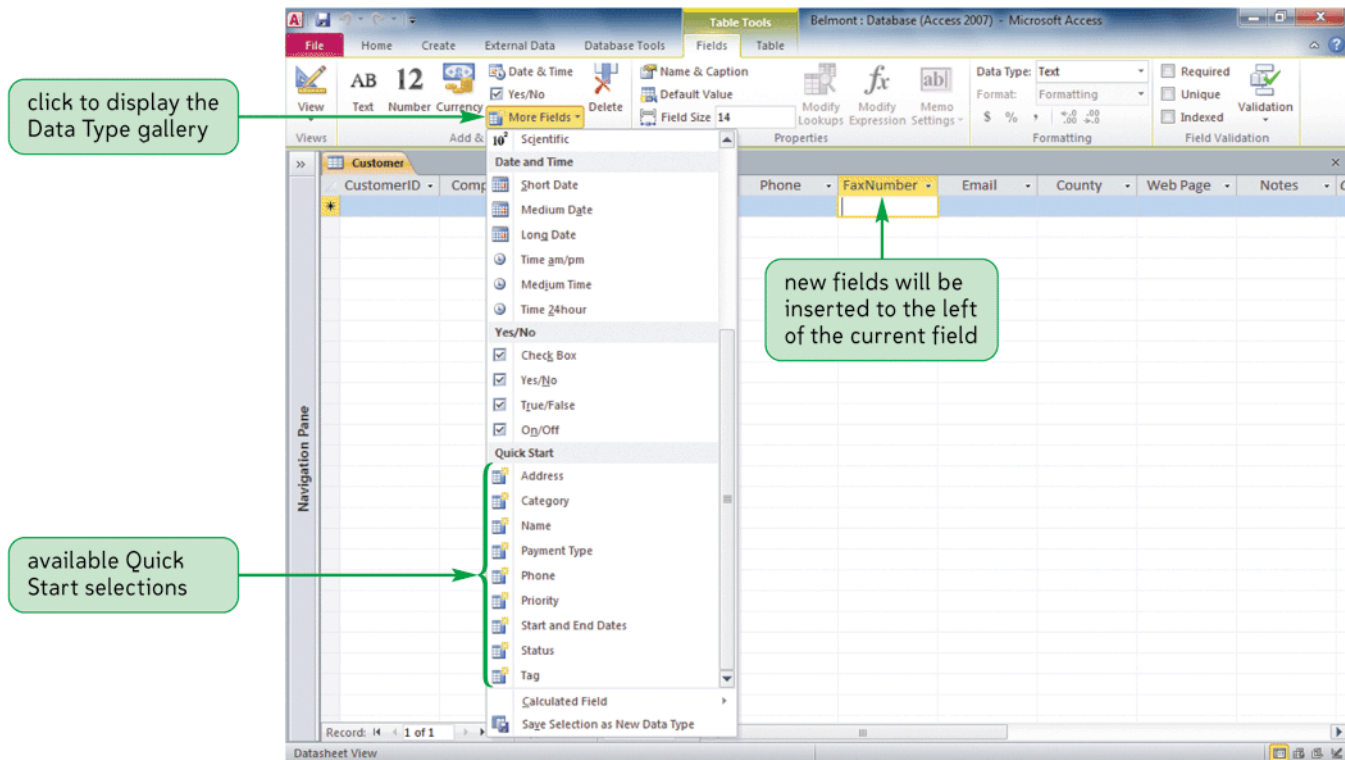
Deleting a Field from a Table Structure

- In Datasheet view, click the column heading for the field you want to delete

- In the Add & Delete group on the Fields tab, click the Delete button

or

- In Design view, click the Field Name box for the field you want to delete

- In the Tools group on the Design tab, click the Delete Rows button

Deleting a Field from a Table Structure

Figure 2-31   Customer table in Design view
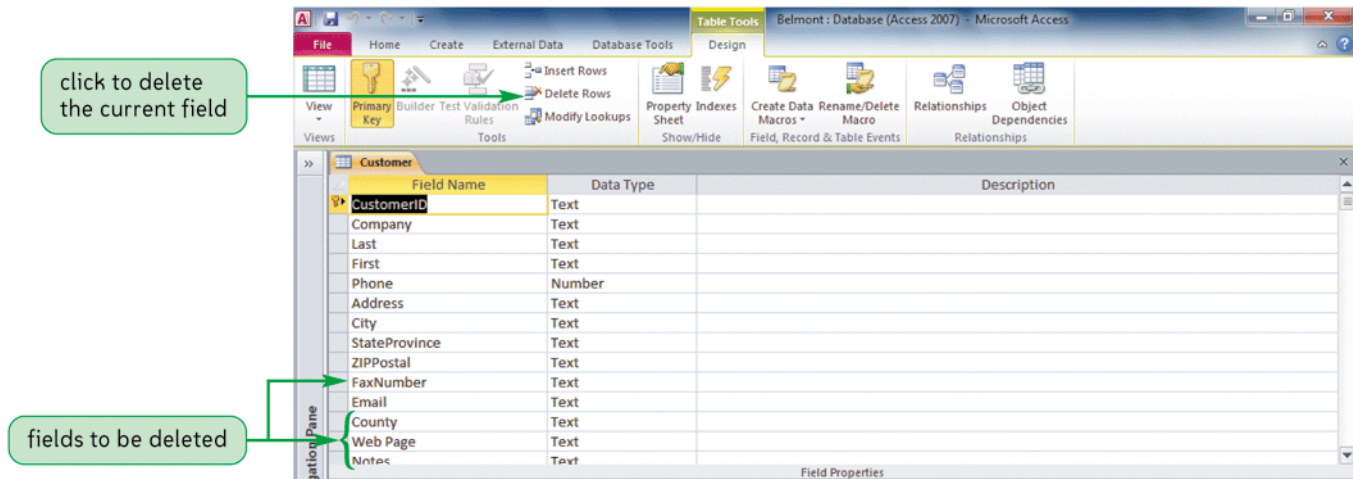
Adding Data to a Table by Importing a Text File

- Click the **External Data** tab on the Ribbon

- In the Import & Link group, click the **Text File** button

- Click the **Browse** button

- Navigate to the file

- Click the **Append a copy of the records to the table** option button

- Select the table

- Click the **OK** button

Adding Data to a Table by Importing a Text File

Figure 2-36   Second Import Text Wizard dialog box

fields in the text file are separated by commas
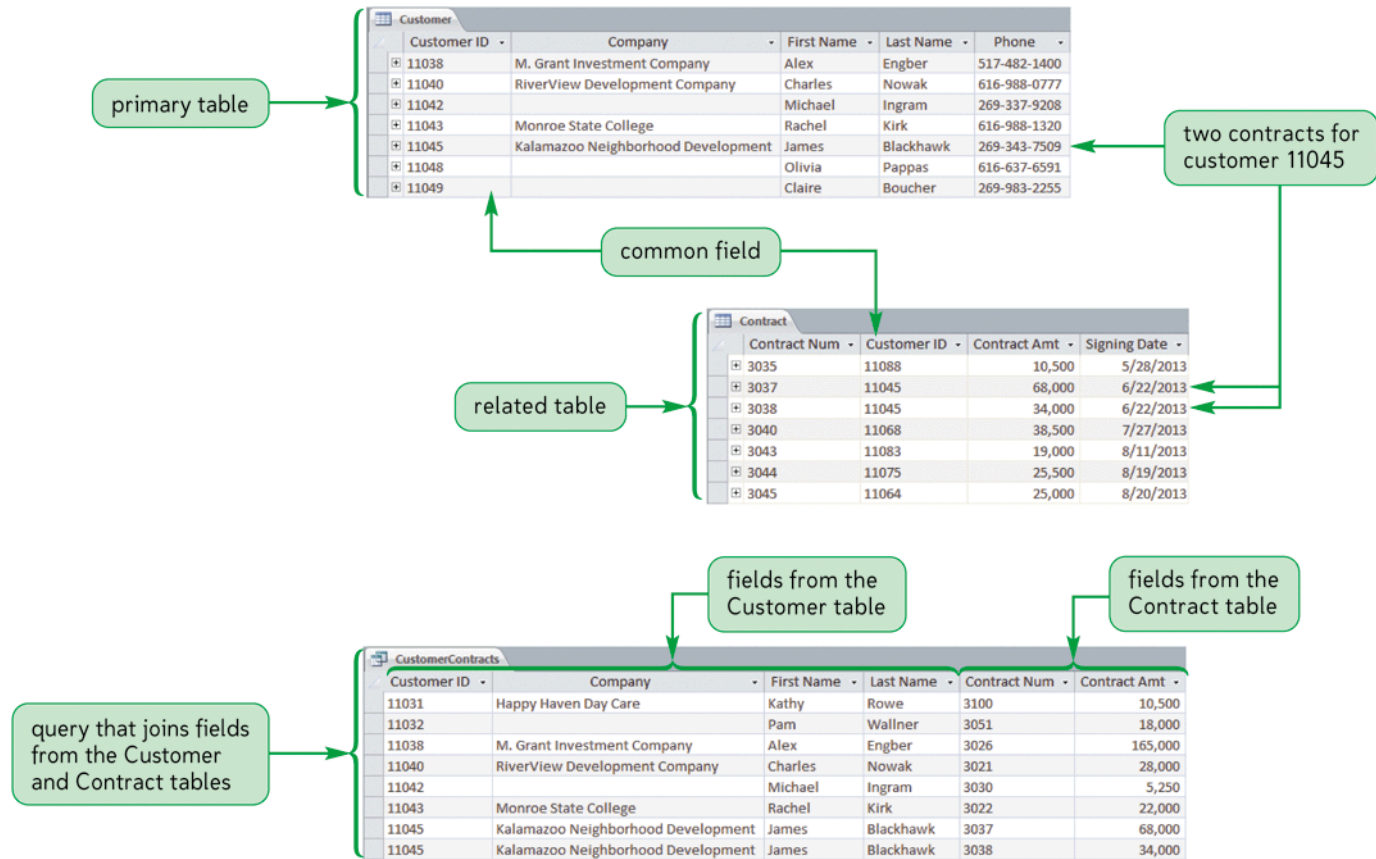
preview of the data being imported
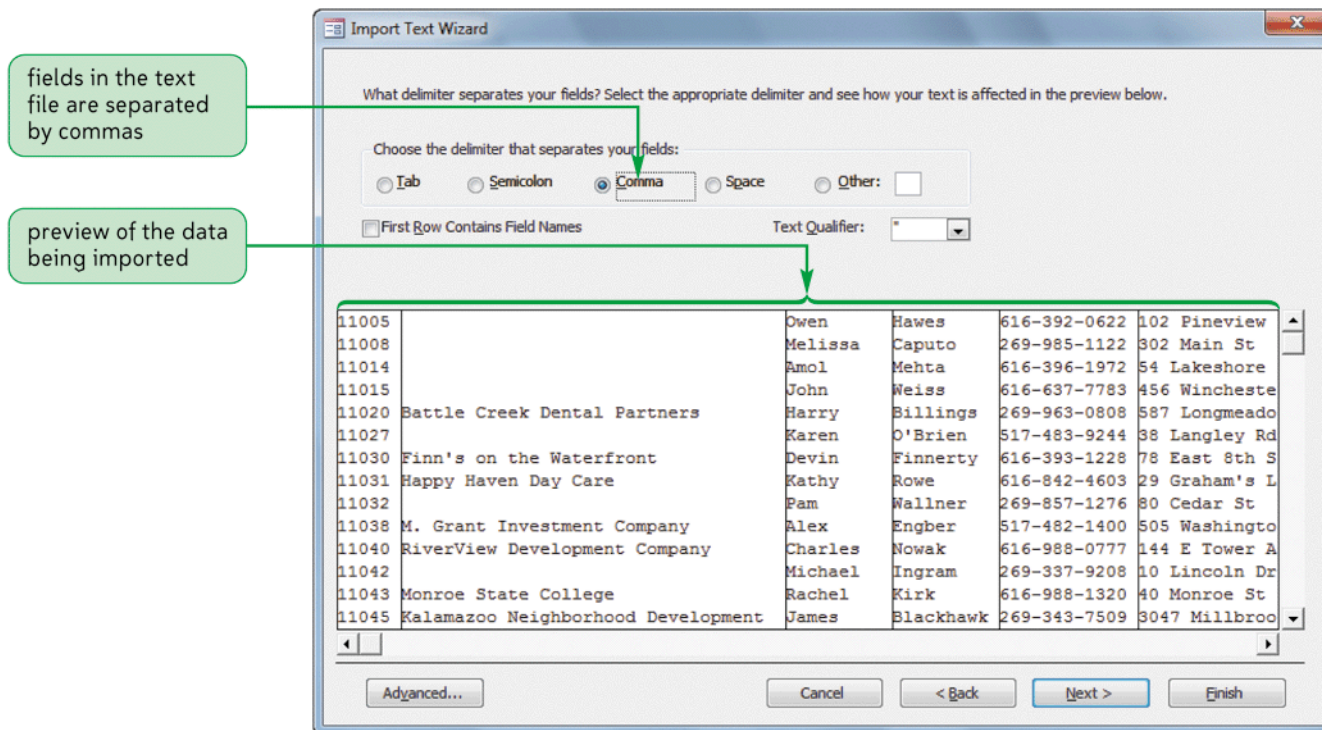
Defining Table Relationships

- One of the most powerful features of a relational database management system is its ability to define relationships between tables

- You use a common field to relate one table to another

Defining Table Relationships

Figure 2-38   One-to-many relationship and sample query
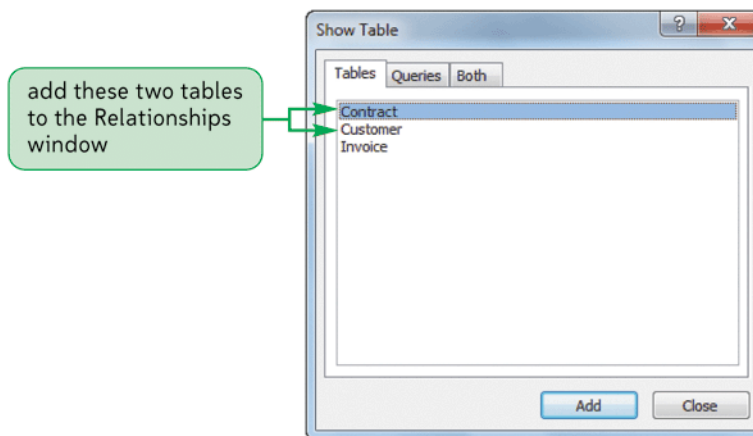
Defining Table Relationships

- A **one-to-many relationship** exists between two tables when one record in the first table matches zero, one, or many records in the second table, and when one record in the second table matches at most one record in the first table

  – The **Primary table** is the "one" in a one-to-many relationship

  – The **Related table** is the "many" table

Defining Table Relationships

- **Referential integrity** is a set of rules that Access enforces to maintain consistency between related tables when you update data in a database

- The **Relationships window** illustrates the relationships among a database's tables

- Click the **Database Tools** tab on the Ribbon

- In the Relationships group on the Database Tools tab, click the **Relationships** button

Defining Table Relationships

Figure 2-39   Show Table dialog box

add these two tables to the Relationships window

Defining Table Relationships

Figure 2-40   Edit Relationships dialog box

- primary table
- related table
- Enforce Referential Integrity option
- common field
- cascade options
- type of relationship
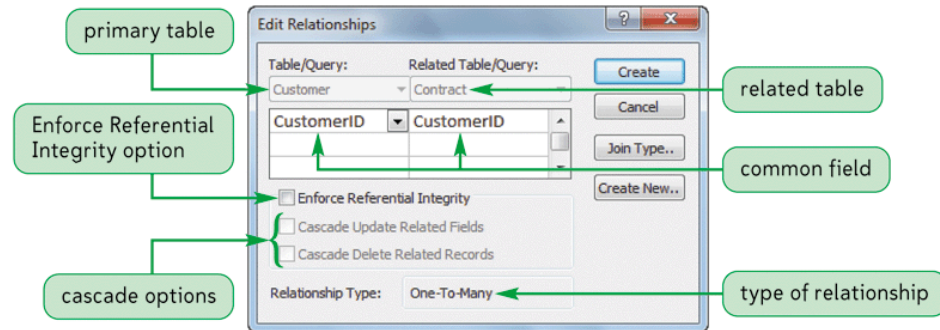
Figure 2-41   Defined relationship in the Relationships window

- "one" side of the relationship represented by the digit 1
- "many" side of the relationship represented by the infinity symbol
- join line
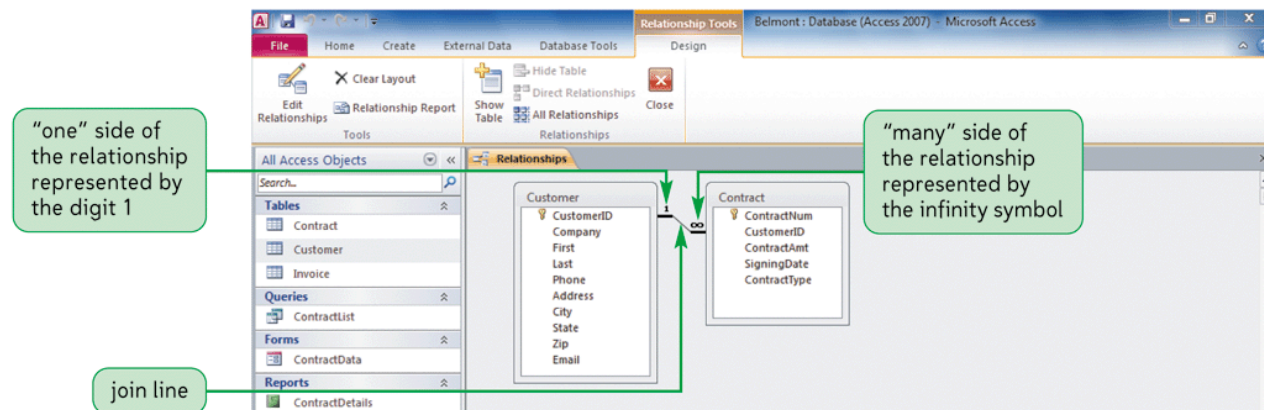
Defining Table Relationships

Figure 2-42   Both relationships defined